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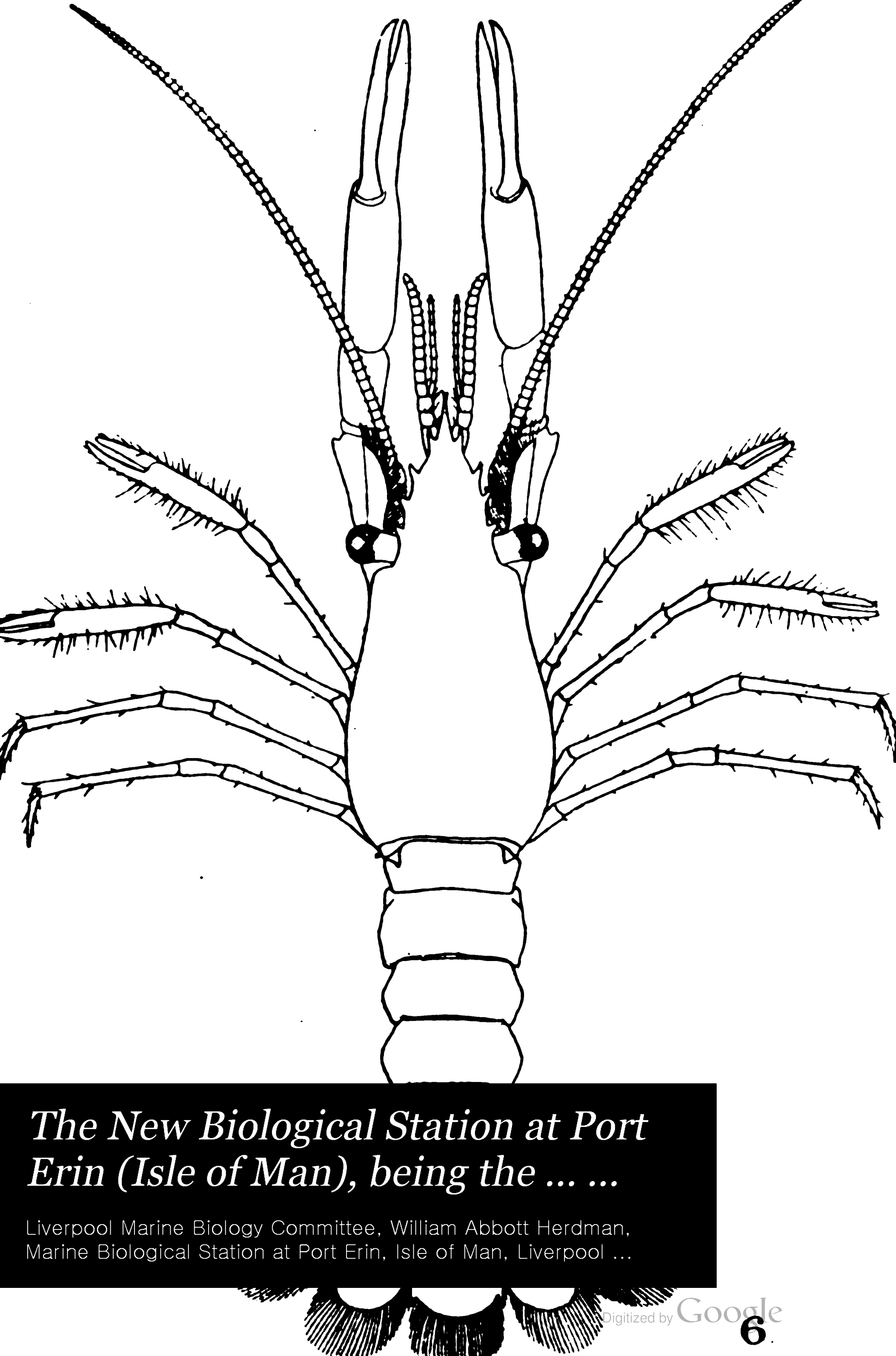

The New Biological Station at Port Erin (Isle of Man), being the ... ...

Liverpool Marine Biology Committee, William Abbott Herdman, Marine Biological Station at Port Erin, Isle of Man, Liverpool ...

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THE NEW BIOLOGICAL STATION AT PORT ERIN
(ISLE OF MAN),

BEING THE

EIGHTEENTH ANNUAL REPORT

OF THE

LIVERPOOL MARINE BIOLOGY COMMITTEE.

BY

W. A. HERDMAN, D.Sc., F.R.S.,
PRESIDENT OF THE LINNEAN SOCIETY OF LONDON AND GENERAL SECRETARY OF THE BRITISH ASSOCIATION;
DERBY PROFESSOR OF NATURAL HISTORY IN THE UNIVERSITY OF LIVERPOOL;
CHAIRMAN OF THE LIVERPOOL MARINE BIOLOGY COMMITTEE
AND DIRECTOR OF THE PORT ERIN STATION.

[Read, in part, before the Liverpool Biological Society, November 11th, 1904.]

WITH AN APPENDIX

ON THE

ANTIQUITIES OF THE ISLE OF MAN,

BY

P. M. C. KERMODE, F.S.A. Scot., and W. A. HERDMAN, F.R.S.

(*WITH MANY ILLUSTRATIONS.*)

LIVERPOOL:
C. TINLING & CO., LTD., PRINTERS, 53, VICTORIA STREET.

December, 1904.

C.

" The expenditure by the Government on scientific research and scientific institutions, on which its commercial and industrial prosperity so largely depend, is wholly inadequate in view of the present state of international competition. . . . . .

The cause is deeper; it lies in the absence in the leaders of public opinion—and, indeed, throughout the more influential classes of society—of a sufficiently intelligent appreciation of the supreme importance of scientific knowledge and scientific methods in all industrial enterprises, and, indeed, in all national undertakings. . . . . .

In my opinion, the scientific deadness of the nation is mainly due to the too exclusively mediæval and classical methods of our higher public schools, and can only be slowly removed by making in future the teaching of science, not from textbooks for passing an examination, but, as far as may be possible, from the study of the phenomena of nature by direct observation and experiment, an integral and essential part of all education in this country."

SIR WILLIAM HUGGINS—*Anniversary Address*
to the Royal Society,
November 30th, 1904.

Liverpool Marine Biology Committee.

Executive.

Chairman and Honorary Director of the Laboratory:

PROFESSOR W. A. HERDMAN, D.Sc., F.R.S.,
University, Liverpool.

Acting Honorary Treasurer:

MR. EDWIN THOMPSON, 53, Croxteth Road, Liverpool.

Committee.

HIS EXCELLENCY LORD RAGLAN, Isle-of-Man.
MR. R. D. DARBISHIRE, F.G.S., Manchester.
PROF. R. J. HARVEY GIBSON, F.L.S., Liverpool.
DR. W. E. HOYLE, M.A., Victoria University, Manchester.
Mr. W. J. HALLS, 35, Lord Street, Liverpool.
MR. P. M. C. KERMODE, F.S.A. Scot., Ramsey, Isle-of-Man.
MR. A. LEICESTER, Liverpool.
SIR CHARLES PETRIE, Liverpool.
MR. A. O. WALKER, J.P., F.L.S., formerly of Chester.
MR. ARNOLD T. WATSON, F.L.S., Sheffield.

Curator of the Biological Station:

MR. H. C. CHADWICK, Port Erin.

Assistant:	*Laboratory Boy:*
MR. T. N. CREGEEN.	WILLIE CHRISTIAN.

Former Members of the Committee:

THE LATE LORD HENNIKER.
THE LATE MR. GEORGE HOLT.
THE LATE SIR JAMES POOLE.
THE LATE MR. ISAAC C. THOMPSON.
THE LATE DR. ISAAC ROBERTS.
SIR SPENCER WALPOLE, K.C.B.
MR. JOHN VICARS.

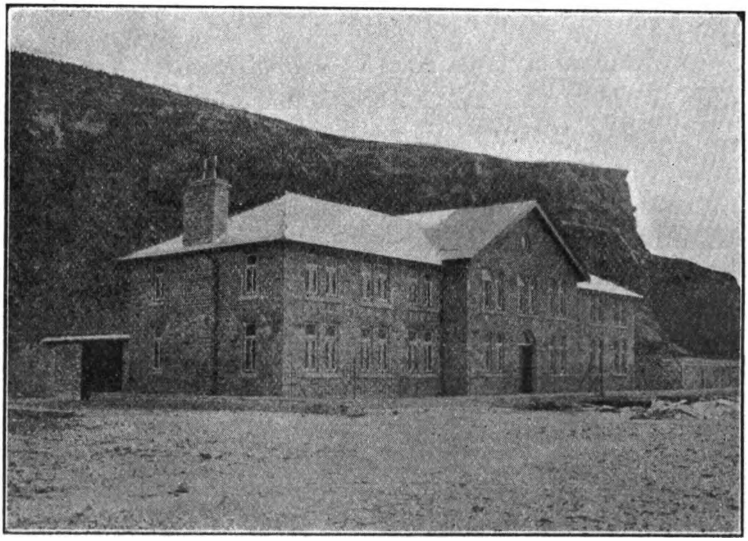

Fig. 1. The New Biological Station.

[FROM TRANSACTIONS LIVERPOOL BIOLOGICAL SOCIETY.]

THE
MARINE BIOLOGICAL STATION AT PORT ERIN,
BEING THE
EIGHTEENTH ANNUAL REPORT
OF THE
LIVERPOOL MARINE BIOLOGY COMMITTEE.

THE past year has been a most successful one so far as regards work. We have had a larger number of students at the Laboratory than in any previous year, the average length of time spent by each in work has been greater, we have had more investigators engaged in original research, we have had greater success in our public meetings, more has been achieved in the fish hatching operations—but at the same time the number of our subscribers is not increasing.

We have this year again a loss by death to record. Dr. Isaac Roberts, F.R.S., was a member of the Committee from its foundation and a constant subscriber to the funds. In the early days, before Dr. Roberts moved from Liverpool, he frequently took part in our dredging and other expeditions. He was keenly interested in all branches of Natural Science, and his great reputation as an original worker in Astronomy must not be allowed to conceal the fact that he was also widely known as a Geologist, had considerable acquaintance with Marine Biology, and was not only a Field Naturalist in his sympathies but also by virtue of his observations. Before the days of University College or the initiation of the present scheme of work, he had made observations on the constituents of the sandbanks in Liverpool Bay, and had written on their contained species of shells. He always on our expeditions took the greatest interest in the dredging and sounding operations, and during the first year of work presented to the Committee a Negretti and Zambra deep-sea reversing thermometer for recording the temperatures of the water at the bottom.

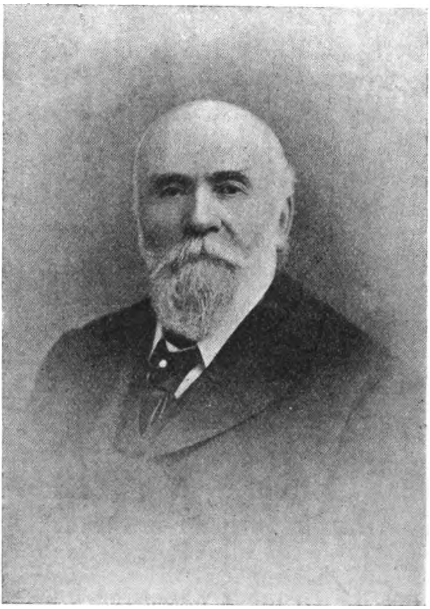

FIG. 2. Dr. Isaac Roberts, F.R.S., F.G.S.

Although Dr. Roberts' removal from Liverpool to the South of England prevented him from taking an active part in the work of the Committee, still he always retained his interest in the work, wrote and sent appreciative messages in regard to its progress, and continued to encourage and support it. We are indebted to Mrs. Isaac Roberts for the accompanying illustration from a photograph of our late member.

These successive losses of our old tried supporters and fellow-workers are very sad, and it becomes increasingly difficult to find similar men, of scientific tastes, in the younger generation prepared to fill the vacant places and devote some time and energy to advancing knowledge of the Natural History of our local seas.

Last year's vacancies on the Committee were filled, at the Meeting held at Easter, in the Biological Station, by the election of Sir Charles Petrie and Mr. W. J. Halls. Both gentlemen have consented to serve on the Committee. Mr. Halls has been with us as a worker for many years, and Sir Charles Petrie has shown his interest in the past in all Marine Biological investigations.

The Committee decided at the Easter Meeting not to fill up, for the present, the post of Hon. Secretary and Treasurer; but requested Mr. Edwin Thompson to kindly continue in office for a time as Acting Treasurer. Mr. Thompson's Report and Balance Sheet will be found appended. The Committee would gladly welcome more fellow-workers—in the form either of Naturalists who will come to the Biological Station and take part in the investigations, or of sympathisers who will help to the extent of an Annual Subscription to the funds.

THE BIOLOGICAL STATION.

The improvements contemplated in last year's Report have now been effected. The tanks on the central tables in the Aquarium (see fig. 3) have been connected up to the system of circulating sea-water. The Museum in the Gallery has been improved, and a useful verandah has been added at the back of the institution, to be used in part by students in the Laboratory for the sorting out of collected material before being taken to the work rooms, and partly as an annexe to the Fish Hatchery, in which animals not required within doors can be kept in tanks under shelter, but exposed to the fresh air.

The windows of the ground floor have been greatly improved by the removal of the heavy wooden sashes and common glass, now replaced by continuous plate glass, which gives much more light to the laboratories. The discarded windows will be used for glazing in the verandàh. The whole of the outside iron and woodwork has also been re-painted. The varnishing of the interior will have to be undertaken soon. There are many other minor improvements which are only postponed from want of funds.

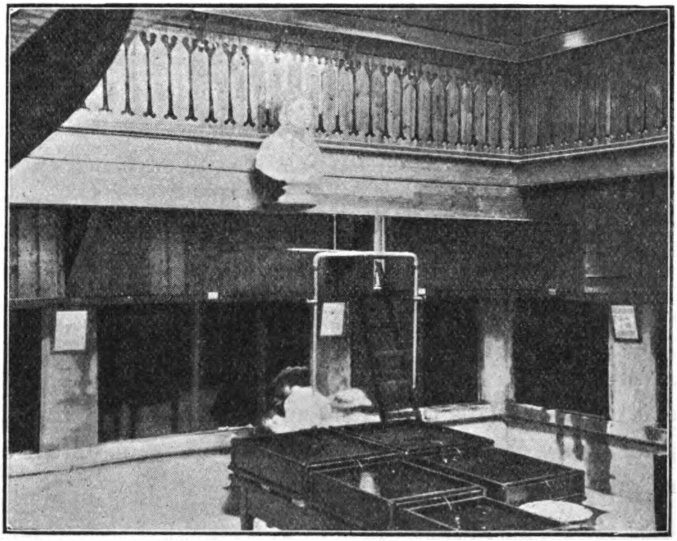

FIG. 3. Interior of the Aquarium. From a photo by Mr. Edwin Thompson.

A new high-level storage tank for sea-water has been placed on the cliff behind the building. This useful addition, which gives a much-needed supply of water to the Aquarium and upper Laboratory, was paid for by part of the profits derived from the visitors to the Aquarium and Museum during last year.

The Fish Pond is now in perfect condition, and has proved most satisfactory in its working during the year. Further particulars in regard to its contents will be given in a later part of this Report. There is nothing new to be stated in regard to other parts of the building. They have all been occupied to their fullest extent on occasions during the year, and all departments continue to give satisfaction to those who have used them.

THE STATION RECORD.

During the past year the following naturalists and students have occupied workplaces in the Biological Station, in addition to the Curator (Mr. Chadwick), who has been in constant attendance.

DATE.	NAME.	WORK.
March 25th to April 7th	Miss Steele, M'chester University Miss Saxelby, do. Miss McNicol, do. Miss Geiler, do.	Marine Algæ.
March 29th to April 9th	Mr. C. Gordon Hewitt, Manchester University Mr. R. H. P. Hick, Cambridge...	Development of Echinus and Isopoda.
April 1st to April 4th	Mr. A. Leicester, Liverpool ...... Mr. W. J. Halls, do.	Mollusca.
April 1st to April 9th	Mr. F. J. Cole, L'pool University Mr. J. H. Wadsworth, Manchester University	General.
April 2nd to April 9th	Miss Cussans, B.Sc., L'pool Univ....	Paguridæ.
	Miss Dennant, Liverpool .... Mr. Shepherd, Castletown......... Mr. Dickinson, Manchester	Nature Study.
April 5th to April 19th	Mr. W. Gunn, Liverpool Univ. ...	General.
April 6th to April 19th	Miss Stocks, Manchester Univ. ...	Tunicata.

DATE.	NAME.	WORK.
April 7th to April 19th	Miss E. Farmer, Liverpool Univ.	General.
April 4th to April 15th	Mr. Dakin, Liverpool University	General.
March 29th to April 22nd	Prof. Herdman, Liverpool Univ.	Official.
April 12th to April 18th	Mr. R. D. Laurie, Oxford	General.
May 20th to May 24th	Prof. Herdman	Official.
June 21st to July 28th	Mr. F. A. Potts, Cambridge	General & Mollusca.
June 25th to June 27th	Prof. Herdman	Official.
June 27th to July 8th	Mr. F. H. Graveley, Manchester University	Hydroida.
July 8th to July 27th	Mr. W. Bygrave, Cambridge	General.
July 12th to August 3rd	Mr. T. H. Burlend, Cambridge	General.
July 22nd to September 19th	Prof. Herdman, Liverpool Univ.	Molluscan Histology
	Miss W. Herdman, do.	Marine Algæ.
July 22nd to July 26th	Mr. J. Lomas, Liverpool Univ.	Structure of shells.
July 26th to August 17th	Mr. A. D. Imms, B.Sc., Birmingham University	Marine Insects.
August 2nd to August 5th	Miss Foster, Sheffield	General.
August 5th to August 12th	Mr. R. D. Laurie, Oxford	Variation in Mollusca.
	Prof. Moore, Liverpool Univ.	Experimental work.
August 6th to August 16th	Mr. C. J. Thompson, Birmingham University	General.
August 8th to September 1st	Miss Lloyd Jones, B.Sc. Manchester University	Hydroida and Tunicata.

DATE.	NAME.	WORK.
August 10th to *August 16th*	Mr. H. A. Whitcombe, Birmingham University	General.
August 12th to *September 2nd*	Mr. W. D. Shuard, London	General.
August 29th to *September 11th*	Mr. F. W. Headley, Haileybury College	Development of Aplysia and Tunicata.
September 3rd to *September 21st*	Dr. J. H. Ashworth, Edinburgh University	Arenicola, and development of Tapes.
September 27th to *October 1st*	Prof. Herdman, Liverpool Univ.	Official.
October 29th to *November 1st*	Prof. Herdman, Liverpool Miss L. R. Thornely, Liverpool	Official. General.

This list contains 42 entries, and 36 individual workers, who may be arranged as follows under the "Tables" that they occupied:—

Liverpool University Table :—

Professor Moore.
Professor Herdman.
Mr. J. Lomas.
Mr. F. J. Cole.
Miss Cussans.
Miss Farmer.
Miss Winifred Herdman.
Mr. Dakin.
Mr. R. D. Laurie.
Mr. W. Gunn.

Liverpool Marine Biology Committee Table :—

Mr. Chadwick.
Dr. J. H. Ashworth.
Mr. A. Leicester.
Mr. W. J. Halls.

Manchester University Table :—

Miss Steele.
Miss Saxelby.
Miss McNicol.
Miss Geiler.
Miss Stocks.
Miss Lloyd Jones.
Mr. C. Gordon Hewitt.
Mr. F. H. Graveley.
Mr. J. H. Wadsworth.

Birmingham University Table :—

Mr. A. D. Imms, B.Sc.
Mr. H. A. Whitcombe.
Mr. C. J. Thompson, B.Sc.

Isle of Man Natural History Society Table :—

Mr. P. M. C. Kermode.
Mr. R. Okell, F.L.S.

Vacant Tables :—

Mr. R. H. P. Hick.
Mr. F. A. Potts.
Mr. W. Bygrave.
Mr. T. H. Burlend.
Miss Foster.
Miss L. R. Thornely.
Mr. W. D. Shuard.
Mr. F. W. Headley.

Mr. Robert Okell, F.L.S., was a constant visitor and worker throughout the year in his official capacity as Secretary to the Fishery Board. We have had many other distinguished visitors, including his Excellency Lord Raglan, the present Governor, and Sir West Ridgeway, a former Governor of the island, Sir Alan Perry, the Bishop of Liverpool, various scientific men, such as Prof. Lyman Clark, Dr. Gustav Eisen and Mr. Edgar Thurston; and, finally, various public bodies, which are mentioned in the Report of the Curator. The Isle of Man Natural History Society continues to take a deep interest in our work, and during September the members held a well-attended meeting in the Institution. The Society has not had a representative doing continuous work in the Biological Station since Mr. Walter Teare left the island last year, but several of their members, such as Mr. Kermode and Mr. Okell, have been frequent visitors; and the Society has recently appointed Mr. Richard Lace, of Santon, to occupy their work table when he is able to do so. The Acting Treasurer, Mr. E. Thompson, came on business. Mr. Kewley, Science Master at King William's College, has visited the Aquarium, Museum, and Laboratories with a large number of boys, and will, we hope, continue to make use of the Institution in this way for educational purposes.

Many of our University Students have supplemented their biological work in the Laboratory with occasional days devoted to Geology and Archæology on the hills. On some of these occasions we have had the advantage of being accompanied by Mr. Lomas as our leader amongst the rocks, and by Mr. Kermode when examining the prehistoric antiquities. From time to time I have been enabled to take part with Mr. Kermode in the examination or exploration of some of the early Manx remains.

The most notable of these occasions was when, some twelve years ago, we excavated the large circle of stone cists on the Meayll Hill above Port Erin, and the foundations of the neighbouring hut villages. The paper that we wrote on the results of our digging has now been long out of print, and the single copy at Port Erin has been frequently consulted and taken out on loan. Consequently we have now been induced, by many demands from our students and from visitors at the Biological Station, to reprint our former paper, with considerable additions, so that it may constitute an illustrated guide to the more important of the ancient monuments and other remains on the island—and in this form it will be found appended to the present Report. I wish to take this opportunity of stating that the greater part of the labour in connection with this work has fallen upon my friend Mr. Kermode, and that his accumulated mass of notes and drawings has been freely drawn upon. This is only to be regarded as the forerunner of a very much more complete and detailed work dealing with the antiquities of his native land--and especially with the early Celtic and Scandinavian carved crosses*—upon which Mr. Kermode has been engaged for some years.

NOTES ON LABORATORY WORK.

Mr. J. Lomas occupied his time at the Biological Station in studying the distribution of Calcite and Aragonite in the layers of various molluscan shells and in testing methods of readily distinguishing between the two minerals.

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* Mr. Kermode's labours in rescuing from destruction and in interpreting these early crosses is well known to antiquaries and others who have seen his remarkable collection of casts and drawings at Ramsey.

Mr. R. D. Laurie worked at variation in *Purpura lapillus* in relation to environment. Professor Moore was making preliminary observations with a view to certain Bio-chemical investigations which he wishes to conduct in our tanks during the coming season.

Mr. A. D. Imms was collecting, studying and preserving the marine apterous insect *Anurida* with a view to the L.M.B.C. Memoir on that type upon which he is now engaged. He also collected, in chinks of the shore, 5 examples of a Pseudoscorpion which he identified as *Obisium maritimum*, Leach (confirmed by the Rev. Pickard Cambridge, who adds that this is only the second record of the species since the days of Leach, the other locality being on the coast of Devon).

I was myself working during most of the summer vacation upon Molluscan Histology, and I got several of the advanced students to undertake the investigation of special points in order to test and corroborate my own observations. In that way Mr. Bygrave and Mr. Burlend did some work on the structure of the Lamellibranch gill and the currents produced by the ciliation, and Mr. Potts examined for me the striped and non-striped fibres of the adductor muscles and started an investigation of the byssus gland which I hope he will finish on another occasion.

Mr. C. Gordon Hewitt occupied the Victoria University of Manchester work-table during the Easter vacation, and reports to me as follows:—

"Owing to the stormy weather I was severely restricted in my work on the Isopoda, as it was only possible to go out to sea twice, and even then it was too rough to use the small dredge. I am, however, able to add two species to the known fauna of the district.

"(1) *Idothea pelagica*, Leach.—A single female specimen was taken in a tow netting in Port Erin Bay. The usual habitat is amongst Algæ at low water mark.

"(2) *Idothea granulosa,* Rathke.—This was found at low water mark in Port Erin Bay. In several respects this form resembles *I. viridis,* Slabber, which Sars considers a distinct species, but although the divergences between the two species are not great in colour, size, shape of coxal plates and metasoma, it agrees with *I. granulosa.* Out of Norway the latter species has not been recorded, so far as I know, except by Mr. A. O. Walker from the West of Ireland, and he tells me that he has very little confidence in the record. The absence of records, however, may well be due to the scarcity of observers and to the superficial resemblance to the immature forms of *I. tricuspidata.* More thorough investigation will no doubt clear up the difficulties in the distribution."

Dr. J. H. Ashworth, of the University of Edinburgh, reports as follows:—

"By Professor Herdman's kind permission I occupied a table in the Laboratory from September 3rd to September 20th. During most of this time I was engaged upon the investigation of certain points in the nervous system of *Arenicola grubii.* This species occurs in fair numbers on the beach near the stone boat jetty, but can be obtained only at the best low tides. *A. ecaudata* also occurs in the same gravel, but is present in much smaller numbers.

"The following notes may be interesting to others who visit the Laboratory during September in future years:

"(1) Specimens of *Tapes pullastra,* which occur in the gravel near the boat jetty were found to be discharging ova from September 9th onwards for about a week. These ova, after being placed in a large volume of sea-water, were readily fertilised by the addition of sperms obtained from a male specimen, and soon afforded good examples of spiral cleavage. In two days we had in our jars thousands of minute ciliated larvæ, showing various interesting phases.

"(2) In the hope of finding young stages of *Arenicola grubii* or *ecaudata*, I cut off from the blocks of the breakwater a large number of the 'roots' of Laminaria, and brought them into the Laboratory to examine. A few of the more promising were placed in a dish of sea-water overnight. In the morning among other objects found there was a small female *Monstrilla*, still enclosed in a portion of the last larval skin, and therefore only newly liberated from its host. On looking over the 'roots' in the dish I found altogether some thirty specimens of a small tubicolous Polychæte, probably a species of *Salmacina*, and on examination these proved to contain young specimens of the *Monstrilla*. The fact that this material can be obtained at Port Erin may be of use to those who are interested in the peculiar life history of this remarkable Copepod.

"I would here express my sincere thanks to Professor Herdman for putting the resources of the Laboratory at my disposal.—J. H. ASHWORTH."

As a contribution to the number of eggs produced by Crustacea, it may be useful to record that Mr. Robert Okell, F.L.S., examined two berried specimens of the large spiny lobster or sea crayfish, *Palinurus vulgaris*, from the Aquarium, with the following result:—

No. 1. Weight 5 lbs.

Total eggs weighed 148.53 grms.
300 eggs counted weighed .2468 grms.

Total number of eggs = 180,000.

No. 2. Weight 3½ lbs.
Total eggs weighed 113.43 grms.
300 eggs counted weighed .2478 grms.
Total number of eggs = 137,000.

The eggs were carefully stripped off, dried in blotting paper and weighed in the chemical balance.

PORT ERIN TOW-NETTINGS.

Mr. Andrew Scott, A.L.S., reports to me as follows:—"The examination of the tow-nettings collected by the L.M.B.C. in various parts of the Irish Sea, which has been carried on from the beginning by my late friend and fellow-worker, Mr. I. C. Thompson, with so much success, as his many reports testify, has, at Professor Herdman's suggestion, been handed over to me. The following notes are based on the investigation of 39 tow-nettings, taken in Port Erin Bay by Mr. Chadwick, between April 23rd, 1903, and September 27th, 1904.

1. **FISH EGGS.**

1903—April	23	Dab.
May	6	Turbot and Dragonet.
„	11	Pollack, Turbot, and (?) Norwegian Topknot.
„	19	Dragonet.
„	23	Pollack, Rockling, Dragonet, and (?) Norwegian Topknot.
June	3	Dragonet.
„	8	Turbot, and Rockling.
„	22	Brill, and (?) Norwegian Topknot.
July	9	Rockling, Poor Cod, and Turbot.
„	14	„ „ „
„	17	„ „ Turbot & Gurnard.
„	22	„ „
Aug.	11	„ Turbot and Weaver.

1904—Feb. 4	Cod.
March 2	,, Plaice and Dab.
April 19	,, and Turbot.
May 4	Haddock, Dab, Megrim, Flounder, and Dragonet.
,, 26	Haddock.
June 4	Whiting, and (?) Norwegian Topknot.
,, 22	Turbot, and Solenette.
,, 27	Lemon Sole, Dab, and Rockling.
July 4	Dab, and Rockling.
,, 16	Rockling.

The identification of preserved fish eggs is attended with many difficulties, and the names can only be regarded as approximately correct, except in a few cases where the characters are so marked that there need be no hesitation in ascribing certain eggs to particular fishes.

2. Post Larval and Young Fishes.

These do not appear to be often taken in surface collections, and their presence has only been noted on two occasions during the period covered by these notes. Two Post-larval Gadoids were taken on May 23rd, 1903. Twelve young Gadoids, 7·5 mm. to 10 mm., and one young Trigla 9·5 mm. in length, occurred in the tow-netting taken on June 4th, 1904.

3. Annelida.

Sagitta were present in 38 out of the 39 collections. The only gathering in which they were absent was the one taken on May 11th, 1904.

Tomopteris occurred in July, September, November, 1903, and January, April, May, June, and September, 1904.

Autolytus were found in September, 1903, and March, April, June, 1904.

4. DIATOMS.

Coscinodiscus and *Biddulphia* were very abundant in the collections taken in April and the early part of May, 1903. These forms gradually decreased and finally disappeared towards the end of June. By the middle of October both genera had reappeared, and continued to increase in quantity; the maximum point in 1904 was reached early in March; none were observed after June 22. On September 27th, 1904, *Coscinodiscus* had just made its appearance again. *Chætoceros* was observed once in 1903 (September 28). In 1904 it was noted in the collections taken in January, February, March, April, and first half of May. None were seen again till September 27, when it was again very abundant.

Rhizosolenia was only noted once during the whole period covered by the 39 tow-nettings (May 11th, 1904).

The gelatinous algæ which frequently chokes up the tow-nets in the summer months, appeared in Port Erin on May 26th, 1903, and remained till July 9th. During 1904 this alga only occurred on May 4th and 11th although it was very abundant off the Welsh and Lancashire coasts during June and July.

5. PROTOZOA.

Representatives of this group occurred very sparingly, and the only forms noted were *Ceratium fusus*, March 2, 1904, and *Ceratium tripos*, November 7, 1903, September 10th and 27th, 1904. A species of *Acanthometra* was very frequent in the tow-nettings taken on

February 4th and 10th, 1904. We have noticed it in various parts of the Irish Sea in previous years, but have never recorded its occurrence.

6. COELENTERATA.

Pleurobrachia was noted in August, September, October and December, 1903, and May, June, July and September, 1904. The pelagic eggs of *Alcyonium* were only observed on January 6th and May 4th, 1904.

7. CRUSTACEA.

Copepoda were found in every tow-netting, and in many cases were abundantly represented. The prevailing form appeared to be *Pseudocalanus*, and was found in every collection. *Temora* was present from April 23rd to November 7th, 1903, but was entirely absent from the collections taken onward to May 26th, 1904. It then reappeared, and was represented in every subsequent gathering. *Calanus finmarchicus*, although rare, was only entirely absent in December, 1903, and January, 1904. *Acartia clausi* was, on the whole, more abundant than *Calanus*—the only months it was not noted were December, 1903, January and April, 1904. *Centropages hamatus* was only present in May, June, July, September, 1903, and May, June, July, August, September, 1904. *Oithona helgolandica*, although present throughout the whole period, was never represented by more than a few specimens. The other Copepoda, such as *Paracalanus parvus*, *Anomalocera*, *Parapontella* and *Isias* were only found on one or two occasions.

Cladocera were represented by *Evadne nordmanni*, *Podon intermedium*, and *Podon leuckartii*. These were only observed in the collections taken during May and June, 1903, and May, June, July, September, 1904. *Podon leuckartii*, G. O. Sars, has not previously been recorded from the L.M.B.C. area.

The Larval stages of some of the Crustacea at certain times of the year make up a considerable portion of the surface plankton. The following are the most prevalent: (*a*) Copepod Nauplii—these were only absent during July, October, November, December, 1903, and July, 1904. (*b*) Cirripedia larvæ. The Nauplii of barnacles are sometimes so abundant that tow-nettings taken in the spring appear to consist of little else than these larvæ. They were only observed in April and May, 1903 and 1904. The "Ostracod" stage were found in May and June, 1903 and 1904. (*c*) Crab "zoea" occurred during April, May, June, July, August, September, 1903, and April, May, June, 1904. The "megalopa" were present during July, August, September, 1903, and September, 1904. (*d*) Larval Crangon were noted for May, June, July, August, September, 1903, and April, May, June, July, August, 1904.

8. TUNICATA.

Oikopleura was observed in the tow-nettings taken during May, June, July, October, 1903, and February, April, May, June, July, August, September, 1904. The eggs of Ascidians were only found once, February 10, 1904.

THE AQUARIUM.

This part of our Institution has fully maintained its popularity amongst the visitors to Port Erin, 11,660 of whom paid for admission during the year. Of this number 7,690 were admitted during the eight weeks ended September 10th, the record number for one day being 486 on August 11th. Increased success has been attained in keeping the fishes and invertebrates in health; indeed, but for the accidental obstruction of the circulation in two of the wall tanks the number of deaths would have been quite insignificant. The erection of a second storage tank at a higher level than the original one, and the inclusion of the table tanks in the system of circulation have contributed materially to this result. The attachment of a glass tube to each of the taps over the wall tanks, whereby the incoming water and bubbles of air are carried down to the bottom of the tanks, has been found to ensure an abundance of well-aerated water in every part. Some of the fishes and invertebrates acquired during the spring and summer of 1903 survived the winter, and are still to be seen in the tanks. The group of tube-building worms, *Sabella pavonia,* mentioned in last year's Report as having been obtained from the harbour buoy, have now lived in one of the table tanks for more than twelve months, and have grown considerably during that time. We may also note as old inhabitants some of the specimens of the Spiny Lobster, *Palinurus vulgaris,* one of which cast its shell recently. The dried shell is now to be seen in the Museum collection in the Gallery.

During the early spring considerable progress was made by Mr. Chadwick with the arrangement of the collections of invertebrates and local fishes in the desk and wall cases in the Museum Gallery, and to these a collection of named marine algæ was added during the spring and summer months by Miss W. Herdman. The Museum is now a valuable adjunct to the Aquarium, the descriptive labels therein adding much to the interest with which many of our visitors watch the movements of the living animals in the tanks.

Remarks upon several other points in connection with the year's work will be found in the Curator's Report to the Committee, which is appended. Mr. Chadwick has taken advantage of the opportunity afforded by the lobster hatching to prepare careful drawings (figs. 5 and 6) of the characters shown at each moult or period of casting the shell between the newly-hatched larva (fig. 5, 1) and the "lobsterling" stage (fig. 6) after the fourth moult. These figures will be more fully described in the new edition of the "Guide to the Aquarium," now in preparation.

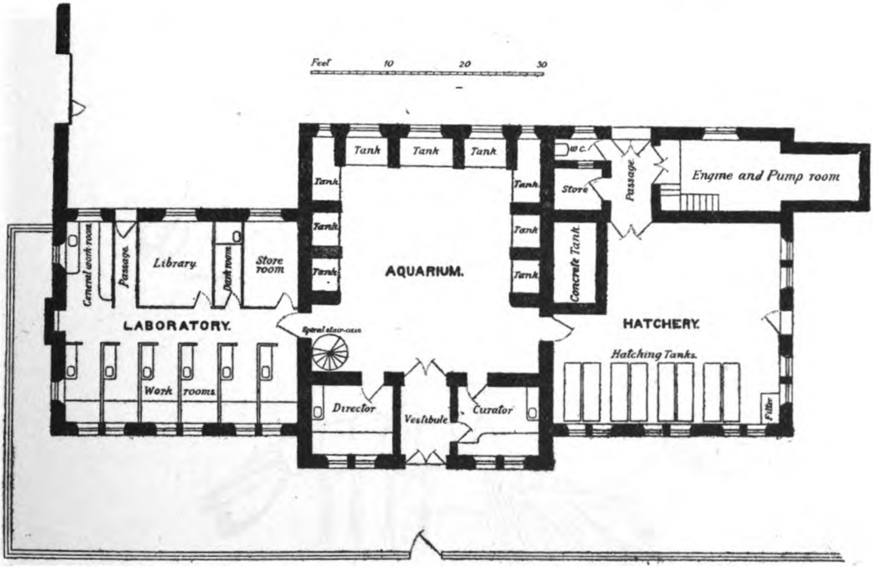


FIG. 4. Plan of Ground Floor of Biological Station.

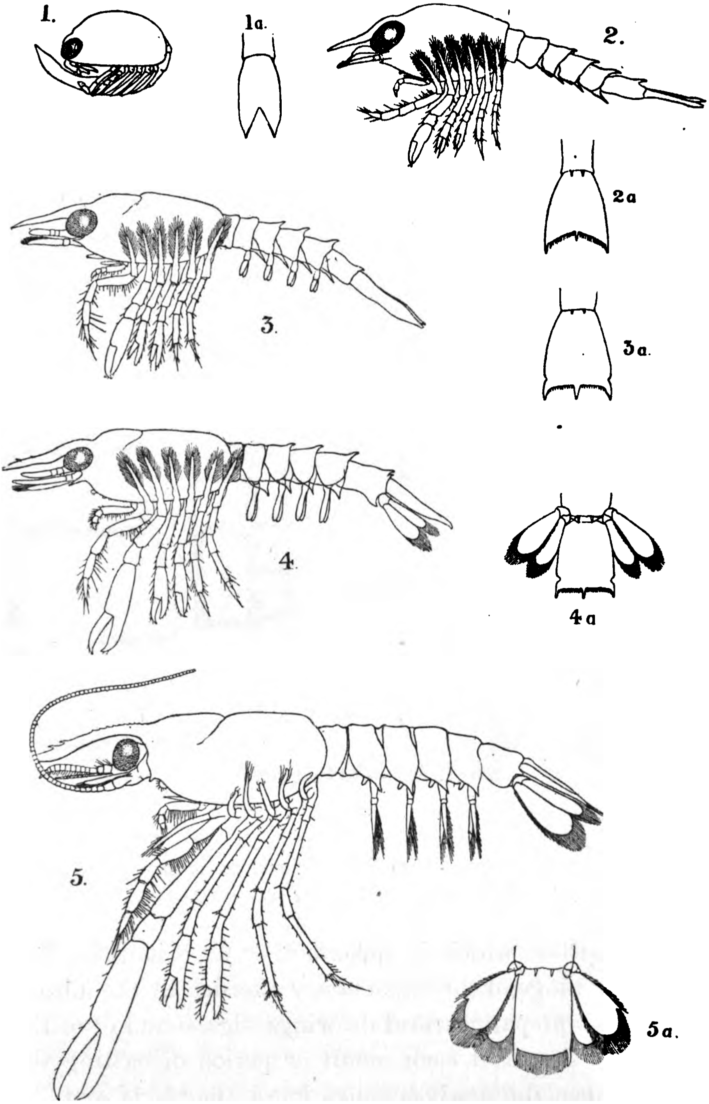


Fig. 5. Stages in the metamorphosis of the young lobster: all × 5.— 1. Larva of lobster as it appears immediately after extrusion from the egg. 1a. The telson viewed from above. 2. Larva of lobster one day old. 2a. The telson viewed from above. 3. Larva of lobster after first ecdysis. 3a. The telson viewed from above. 4. Larva of lobster after second ecdysis. 4a. The tail viewed from above. 5. Larva of lobster after third ecdysis. 5a. The tail viewed from above.

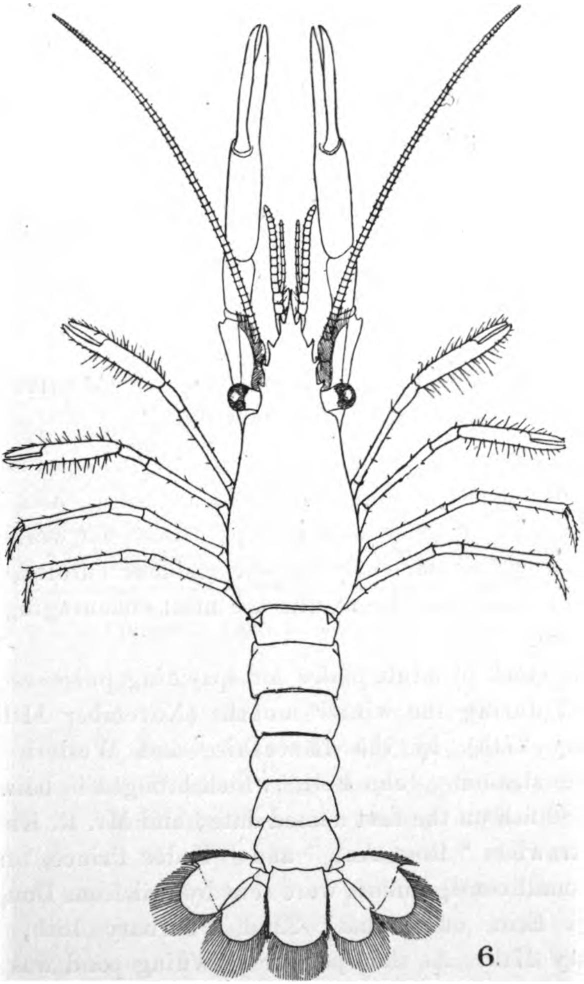


Fig. 6. Number 6. Young lobster, or "lobsterling," after fourth ecdysis, in the attitude assumed in swimming : × 5.
The little animal is now in the stage when it assumes the adult characters.

SEA-FISH HATCHING AND REARING.

The Economic Fisheries work was carried on quite successfully in the Hatchery last spring, although we have no doubt that still larger numbers will be dealt with in the future. This work is under the control of the Manx Fishery Board; but as the Liverpool Committee and their subscribers and friends will probably be interested to hear of the progress of the hatching and rearing of sea-fish in our district, I shall give here a portion of the Report on the subject which I drew up in June, 1904, for the information of Tynwald Court.

"HONORARY DIRECTOR'S REPORT TO THE COMMITTEE FOR THE YEAR 1903-1904."

This has been the first year of working with all necessary equipment and with completed apparatus, and it is very satisfactory to be able to report that the work has been carried on efficiently by our resident curator, Mr. Chadwick, and that the results are most encouraging for the future.

The stock of adult plaice for spawning purposes was acquired during the winter months (November 11th to February 27th), by the Lancashire and Western Sea Fisheries steamer "John Fell," which brought in between 70 and 80 fish on the first named date; and Mr. R. Knox's steam trawlers "Rose Ann" and "Tudor Prince," from which small consignments were sent by rail from Douglas to Port Erin, on January 22nd, February 18th, and February 27th. As the open-air spawning pond was not quite ready for their reception, the fish were kept for some time in the three largest tanks in the Aquarium; but on February 1st and 2nd ten of the smaller plaice were transferred to the pond, now water-tight and purified, and the remainder followed on the 22nd. During a final examination of the pond, at the beginning of the spawning season, it was found that very few fish had died, and that at least 105 healthy plaice remained, which produced abundance of spawn.

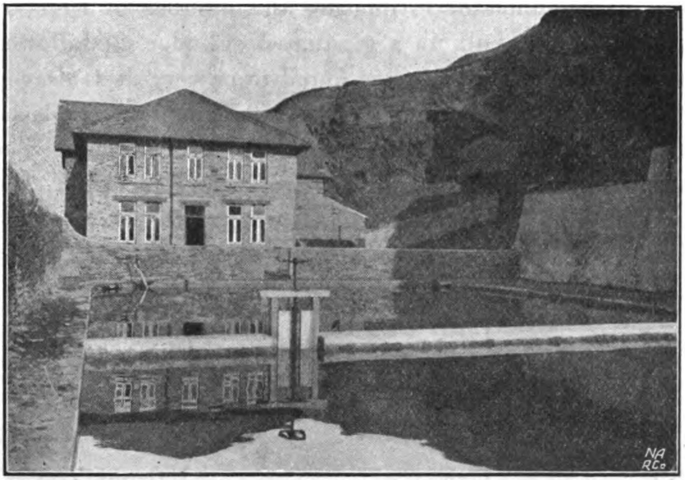


Fig. 7. The Fishpond. From a photo. by Mr. Edwin Thompson.

No difficulty has been experienced in keeping the pond in good condition. Fresh sea-water has been pumped into it almost daily. Green Algæ have grown on the sides, and Diatoms and microscopic animals are present in abundance in the water. The hatching apparatus was fitted-up during the last ten days of January, and was subjected to prolonged soaking, with daily circulation of water for five weeks, before being brought into use. Though susceptible of improvement in certain points of detail, it has worked satisfactorily; the balance apparatus, devised by Mr. Okell, being a distinct improvement upon that at the Lancashire Hatchery at Piel.

The first fertilised eggs of the plaice were found in the pond on March 3rd, and the numbers increased day by day until April 12th, when fully 500,000 were collected. After that date the numbers began to diminish, and none were collected after May 5th.

The method of estimating the number of eggs by measuring the bulk in a graduated cylinder, as followed hitherto and elsewhere, was found to be very destructive; so after a trial, extending over a fortnight, it was replaced by the method of counting measured samples. The numbers of eggs collected during the first fortnight, and estimated by the former method, were as follows:—

Date.	Number of Eggs.
March 10th	10,000
„ 12th	10,000
„ 14th	40,000
„ 15th	25,000
„ 16th	50,000
„ 17th	100,000
„ 18th	18,000
„ 19th	24,000
„ 21st	2,500
„ 22nd	9,000
„ 23rd	11,000
„ 24th	16,000
„ 25th	15,000
„ 26th	12,000
„ 28th	30,000
„ 29th (stormy day)	2,000
„ 31st	30,000

After the last date the amount of eggs was estimated by counting the actual number in samples containing 10 c.c. of water taken three or four times from the hatching box, after a thorough mixing of the contents, and was as follows:—

Date.	Number of Eggs.
April 4th	20,000
,, 9th	50,000
,, 12th	500,000
,, 13th	200,000
,, 14th	50,000
,, 15th	50,000

Eggs in gradually diminishing numbers were collected almost daily until May 5th; but the numbers were not estimated, owing to the difficulty of separating the eggs from the larvæ, which were then hatched out in the pond from eggs which had escaped collection on earlier dates.

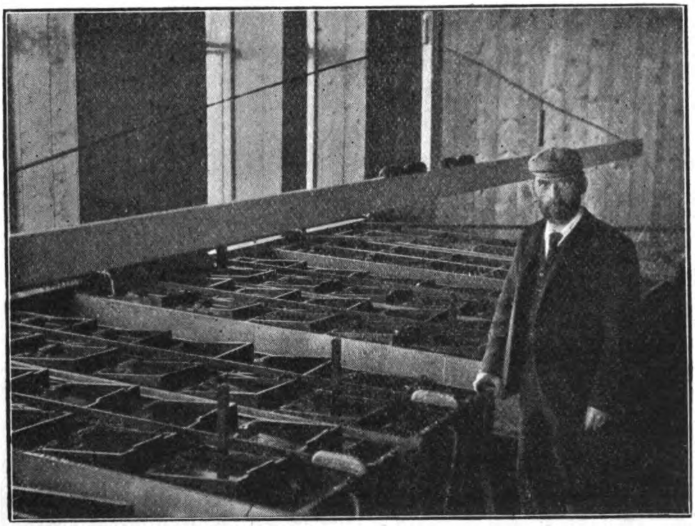


Fig. 8. Interior of the Hatchery, showing the "Dannevig" hatching boxes and Mr. Chadwick. From a photo. by Mr. Wm. Dakin.

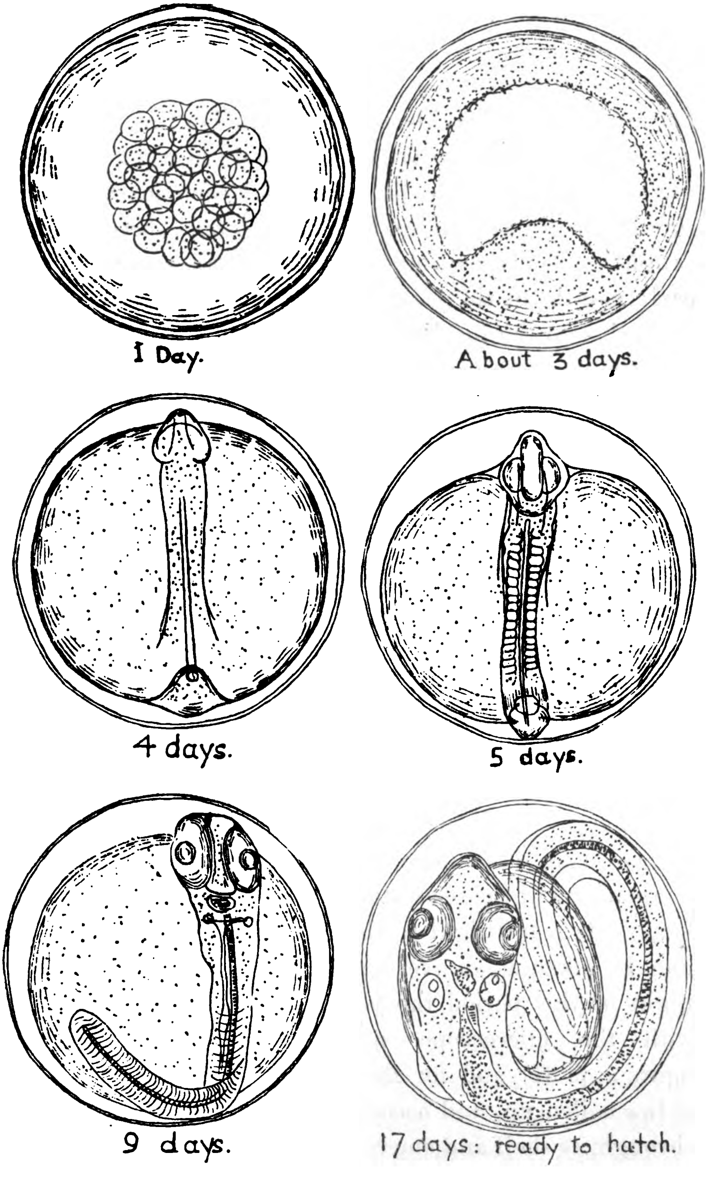
The first larvæ were hatched out in the boxes on March 30th; and the first liberation of larvæ in the sea took place on April 10th, when a few thousand were successfully set free in the Calf Sound. On succeeding days larvæ were liberated at sea either to the east or the west of the Calf Island, according to the weather, as follows:—

Date.	Number of Larvæ.
April 11th	30,000
,, 12th	30,000
,, 13th	150,000
,, 14th	130,000
,, 16th	70,000
,, 18th	35,000
,, 21st	184,000
,, 23rd	44,000
,, 27th	50,000
,, 29th	45,000
May 4th	43,600
,, 6th	7,200
	818,800

As all the above numbers are based on minimum countings and estimates, the total is almost certainly greater than that shown; and I think it is safe to conclude that we liberated about a million of healthy young plaice in the open sea. We hope to deal with still larger numbers next year. Our pond will accommodate a much larger number of spawning fish than we had this year. Our hatching boxes will hold more eggs, and we have room to add, if necessary, further ranges of boxes.

We hope, also, to make some improvement in the mechanism and circulation of water, which will prevent a certain wastage of eggs that occurred this season.

It is evident, from questions that have been asked by those who saw the hatching in progress, that some



1 Day.

About 3 days.

4 days.

5 days.

9 days.

17 days: ready to hatch.

FIG. 9.—Embryonic development of Plaice.

information as to the life-history and habits of the young plaice may be a useful addition to this report.

The average size at which the female plaice becomes mature in our seas is about 14 to 15 inches; and if it were possible to so regulate matters, it would be very desirable, in the interests of the fisheries, that each mature plaice should be allowed to spawn at least once before being caught. The spawning in our seas takes place in the early months of the year—a little earlier or a little later, according to the locality and temperature of the season—but we may say, in general, from January or February to May, with a maximum in March. The fertilised egg is spherical and transparent, floats at the surface of the sea, and measures about 1-12th of an inch (1·9 mm.) in diameter. The period that the embryo remains inside the egg-covering also depends, to some extent, upon the temperature of the sea water at the time. It may probably vary from a fortnight to three weeks; and 17 or 18 days may be taken as an average time. During the last fortnight of this period the young fish may be clearly seen with the microscope inside the egg-covering (see figure 9, p. 31), and for the last few days before hatching it lies coiled up, and occasionally moving, ready to burst through its shell and emerge as a larva.

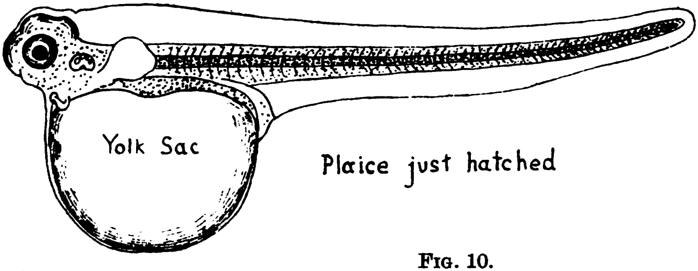


FIG. 10.

When the larval plaice hatches out (see figure 10) it is about $\frac{1}{4}$ of an inch (7 mm.) in length, and is unable to feed through its mouth; and so for about a fortnight it obtains its nutriment solely from the food-yolk contained in the yolk-sac, which hangs down from the lower surface of the body. During this period it is active and leads a surface life, partly swimming spasmodically by contractions of the muscular tail, and partly drifting passively with the current. It can do little as yet to avoid an enemy, and is easily caught with a small net, a dish, or a dipping tube. After about a fortnight the larva begins to feed. The yolk has then been used up, the jaws have formed, bones have developed in its body, the muscular system is stronger, and the little fish is able to pursue and capture prey, to eat and digest its food. This at first consists of Diatoms, the spores of sea weeds and other vegetable matters, and a little later on of Copepoda and other minute animals. Post-larval stages taken from our pond in May were found when 5 mm. long to be feeding on alga spores, and when 7 mm. on Copepoda.

The young post-larval plaice, when it begins to feed, is about one month old, counting 18 days for hatching and 12 for the absorption of the yolk. Another month is probably required, as a rule, for the transformation of this bilaterally symmetrical little fish into the completely metamorphosed unsymmetrical flat-fish, with both the eyes on one surface (the right side) of the body, and with a distribution of pigment which causes this upper side to be dark-coloured and the lower light. Young plaice, with the metamorphosis completed, have been found only a little over half an inch in length (14 mm.) in June; but they are usually about an inch long when they appear in our sandy bays during the summer. In the post-larval stages they lived at the surface, so during the period of their transformation they must be making their way to the bottom, and changing their mode of life from the pelagic larval one, where the food is Copepoda and other surface organisms, to that of the ground-living adult, feeding on shellfish and worms.

When floating on the surface as eggs, in the embryonic stages and as larvæ, they are the natural prey of innumerable organisms around them, from medusæ to fishes; and it cannot be doubted that the destruction must be very great, especially in the younger stages. The post-larval forms seem better able to avoid enemies and to take care of themselves; while when the metamorphosis has taken place, they are probably safe from many dangers which threatened them in the earlier periods. Consequently, protection in a hatchery must save a very large proportion of the eggs and larvæ from what would otherwise be their natural fate.

During the present hatching season we have set free our plaice larvæ when between a week and a fortnight after hatching, our object being to keep them as long as possible so as to protect them from destruction in the sea, but to let them out before the yolk-sac was all absorbed and external food required.

No doubt it would be still better if we could safely keep them longer, see them through the period of metamorphosis, and set them free in our bays as young flat-fish. That natural sequel to artificial hatching, viz., rearing the young fish in captivity, will no doubt come; and we are now experimenting in the matter by allowing a certain number of the larvæ to remain developing in our spawning pond. It is satisfactory to find that these are passing through the post-larval period, and are undergoing their metamorphosis. Some have already been seen at the shallower side of the pond as fully formed young flat-fish, over an inch in length. There seems to be abundance of food, both animal and vegetable, in the water of the pond; and Copepoda have been seen in the stomachs of the young fish.

Finally, in setting free the hatched larvæ, we have been careful to place them in the water well off the land, in a tidal current running clear of the island, so that they should be carried to regions where we find the naturally hatched fish in similar stages, and from which they will find their way gradually, after metamorphosis, into the shore, and appear in due course as young plaice in the shallow waters of our sandy bays.

Since the above was written the young plaice being reared in the pond were seen from time to time throughout the summer, generally lying on the bottom at the shallow end, and darting away very actively when the water was disturbed. At the end of September we decided to run nearly all the water out of the pond and examine the contents for the three-fold purpose of (1) seeing the condition of the bottom; (2) of finding out the exact number and state of our stock of adult fish; and (3) of observing the size attained in a known period by these young plaice. This interesting piece of work, which occupied the greater part of a week, was undertaken during the 26th to 30th of September, with the following result:—

Out of 180 adult plaice which had been added to the pond at various times since the previous autumn (1903), 168 were successfully transferred to the lower and larger sea-water supply tank behind the Hatchery. The condition of these fish was all that could be desired; they were strong and well fed; many were very large. There was evidence (bones) of the death of three fish in all, and five others were found suffering from abrasions of the skin or fins, and were not returned to the pond, but were put temporarily in hospital tanks in the Aquarium. This leaves four plaice still unaccounted for, but as the water was not entirely drawn off from the deepest corner of the pond these may well have been missed in the probing of the sand at the bottom.

There were found to be very many of the young plaice which had been hatched in the Institution last Easter, from eggs spawned by the larger fish, and so have been under artificial conditions—made as natural as possible—during the whole of their existence. These young plaice, four to five months old, varied from one to four inches in length (the large variation in size is noteworthy), and seemed active and well nourished. The great majority were left as they were in the damp sand and shallow water. From their habit of burrowing in the bottom as the water retreated it was found to be practically impossible to capture them in large numbers, so as to form even an approximate estimate of their quantity. Some hundreds were picked out for experiments in rearing in the small wooden tanks lately fitted up in the verandah. The young plaice examined were found to be feeding mainly on Copepoda.

In the pond there were also shown to be some shrimps, a number of young Gadidæ (the "Bib" and the "Poor Cod"), and a small shoal of young herring (whitebait size). These must have passed through the pumps from the sea, probably in a larval condition. The bottom of the pond was found to be in a satisfactory condition, and many invertebrates, such as Anemones, Ascidians, Polyzoa, Serpulids, and other smaller things, in addition to Algæ, were growing on the stones and sidewalls—showing that plenty of food was being naturally provided for the young fishes.

The pond was then re-filled, and the large plaice successfully put back. Since that time our trammel nets have brought the number up to over 200, and the Lancashire and Western Sea Fisheries steamer "John Fell" has (through the courtesy of the Committee and of the Superintendent, Dr. J. Travis Jenkins) been enabled to spend a day trawling for us, with the result that 110 plaice have been added, making the total of our stock in the pond now somewhere about 320*. From these fish we hope to get abundance of spawn in the coming season.

A number of the young plaice, 4 to 5 months old, that were kept in tanks have since been measured. Four samples, caught by the laboratory boy, and taken as they chanced to come, amounting to 80 fish in all, were of sizes ranging from ¾-inch to 3½-inches; only three of them were over 3 inches, and the majority were between 1½ and 2-inches. A very considerable proportion had a certain amount of dark pigmentation on the lower surface. Out of one batch of 47, 25 showed this ambi-colouration, and only 22 were normal.

EASTER CLASS FOR SCHOOL TEACHERS.

This subject has been referred to in former Reports, and now that the new buildings afford the necessary accommodation, the L.M.B.C. has, in consultation with the Nature-Study Association of Teachers in Liverpool, drawn up the following intimation which was circulated last spring, and is now repeated with a few changes:—

SPECIAL CLASS IN MARINE BIOLOGY, OR NATURE-STUDY, FOR SCHOOL TEACHERS, TO BE HELD AT PORT ERIN, ISLE OF MAN, DURING THE EASTER HOLIDAYS, 1905.

The Liverpool Marine Biology Committee, in response to a demand, is willing to make arrangements for a special class in Elementary Marine Biology, to illustrate the principles of nature-study, and to be held at the Port Erin Biological Station during the Easter holidays, 1905. The Station is a new building situated on the sea-shore, and is admirably adapted in every respect for classes of this description.

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* Of these 118 have been caught at Port Erin during the Summer in our trammel nets.

A large laboratory on the first floor, provided with fourteen windows, will be set aside wholly for this purpose during the time of the class. Each member of the class will occupy a table or workplace opposite a window, and will be provided with the necessary animals (or when possible, and as is much better, will be shown how to collect them himself), salt and fresh water, and all materials and apparatus necessary for the work.

The course is necessarily restricted to the Easter holidays, and will extend from a Saturday to a Saturday in April, in the week that is found most convenient to teachers. If, however, any are able and willing to stay for a longer period, further arrangements can be made at the time.

The class will be limited to twelve students, each of whom will pay 5s. to the L.M.B.C. for the use of the laboratory, and in addition a tuition fee of 5s. These fees should be remitted to Mr. Chadwick before the opening of the class. No definite time table of the class work can be drawn up, and the time and nature of the work will depend largely on the tides, weather, &c. Speaking generally, however, the class will spend the morning in the laboratory, examining animals in the living condition, and making simple biological experiments thereon. In the afternoons collecting excursions, with the object of studying the animals in their natural surroundings, and also expeditions for collecting and dredging from boats, will be organised and led by members of the L.M.B.C. At other times short addresses and demonstrations in the aquarium and museum will be given by Prof. Herdman, and possibly others. No previous knowledge will be supposed. The class work will be directed by Mr. F. J. Cole, Lecturer and Demonstrator of Zoology, University of Liverpool.

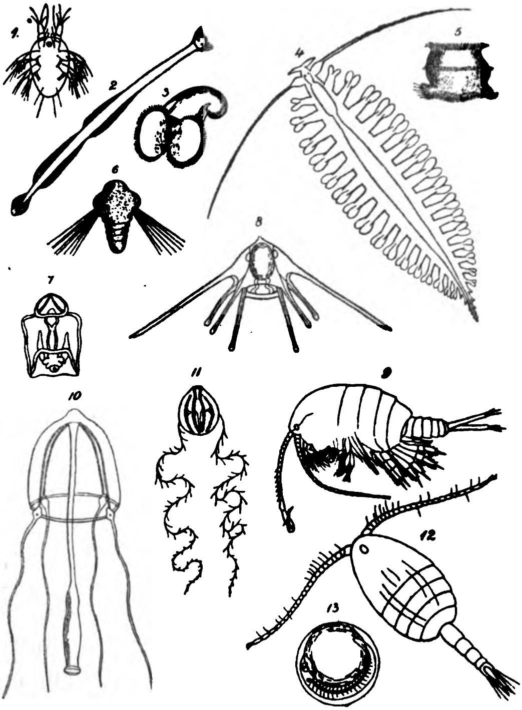


FIG. 11. Plankton or Surface-life of the Sea at Port Erin.

The Treasurer of the L.M.B.C. wishes to point out that, as the charge is at about one half the usual rate for accommodation, it must be regarded as a special charge for this occasion, and for a class of not less than ten or twelve, and will not apply to single students or at other times.

Each member of the class must come provided with a large drawing-book, pencils and india-rubber and a duster or small towel. All further apparatus, as follows—enamelled dissecting dishes, with wax at the bottom, several crystallising dishes and watch glasses, microscope slides and cover-glasses, dipping tubes, some simple dissecting instruments, a magnifying hand lens, occasional microscopes, and collecting jars, will be lent, without charge, by the L.M.B.C., to the students.

If the student wishes to take away any animals for examination at home, bottles, tubes and methylated spirit and other preservatives can be bought from the Station stock on application to the Curator.

Any further details may be arranged and questions asked, before the class commences, by correspondence with Mr. F. J. Cole, University of Liverpool.

L.M.B.C. Memoirs.

The two Memoirs announced in last Report, viz., No. XI., Arenicola, the fisherman's lob-worm, by Dr. J. H. Ashworth; and No. XII., Gammarus, one of the sand-hoppers, by Miss M. Cussans, have been published during the summer. Both are illustrated by fine plates, some of which are coloured.

The Memoirs on Myxine, by Mr. Cole, and on Antedon, by Mr. Chadwick, are both far advanced, and may be looked for during the coming year. The complete list of the Memoirs published and in contemplation is now as follows:—

Memoir I. Ascidia, W. A. Herdman, 60 pp., 5 Pls., 2s.
„ II. Cardium, J. Johnstone, 92 pp., 7 Pls., 2s. 6d.
„ III. Echinus, H. C. Chadwick, 36 pp., 5 Pls., 2s.
„ IV. Codium, R. J. H. Gibson and Helen Auld, 26 pp., 3 Pls., 1s. 6d.

Memoir V. Alcyonium, S. J. Hickson, 30 pp., 3 Pls., 1s. 6d.
" VI. Lepeophtheirus and Lernæa, Andrew Scott, 62 pp., 5 Pls., 2s.
" VII. Lineus, R. C. Punnett, 40 pp., 4 Pls., 2s.
" VIII. Plaice, F. J. Cole and J. Johnstone, 260 pp., 11 Pls., 7s.
" IX. Chondrus, O. V. Darbishire, 50 pp., 7 Pls., 2s. 6d.
" X. Patella, J. R. A. Davis and H. J. Fleure, 84 pp., 4 Pls., 2s. 6d.
" XI. Arenicola, J. H. Ashworth, 126 pp., 8 Pls. 4s. 6d.
" XII. Gammarus, M. Cussans, 55 pp., 4 Pls., 2s.
Myxine, F. J. Cole.
Antedon, H. C. Chadwick.
Buccinum, W. B. Randles.
Bugula, Laura R. Thornely.
Oyster, W. A. Herdman and J. T. Jenkins.
Ostracod (Cythere), Andrew Scott.
Portunus, J. Pearson and W. Tattersall.
Cycloporus, F. F. Laidlaw.
Dendronotus, J. A. Clubb.
Anurida, A. D. Imms.
Peridinians, G. Murray and F. G. Whitting.
Zostera, R. J. Harvey Gibson.
Himanthalia, C. E. Jones.
Diatoms, F. E. Weiss.
Fucus, J. B. Farmer.
Botrylloides, W. A. Herdman.
Cuttle-Fish (Eledone), W. E. Hoyle.
Actinia, J. A. Clubb.
Hydroid, E. T. Browne.
Calcareous Sponge, R. Hanitsch.

In addition to these, other Memoirs will be arranged for, on suitable types, such as *Sagitta* (by Mr. Cole), a Cestode (by Mr. Shipley), an Isopod (by Mr. C. G. Hewitt), and a Pycnogonid.

As to our other L.M.B.C. publications, a sixth volume of the "Fauna" will soon be issued. Copies of most of the Annual Reports can still be had. Many of them have some special Appendix or characteristic feature in addition to the routine work of the year. For example, No. 6 (1893) has the account of the opening, by Sir Spencer Walpole, of the old Biological Station, No. 13 (1899) has Notes on the Plankton of Port Erin, No. 14 (1900) gives faunistic charts and lists of the bay and the neighbourhood, No. 15 (1901) has as an Appendix the illustrated "Guide to the Aquarium," No. 16 (1902) contains the description and figures of the new Biological Station, while in our last Report (No. 17) there appeared the portrait and Memoir of our late Hon. Treasurer, Mr. Isaac C. Thompson, F.L.S.

The copies of the "Guide to the Aquarium," which are on sale at the Biological Station, will probably be exhausted this season. An enlarged second edition, with additional matter and some new illustrations, is now in preparation.

We append to this Report:—

A—The Curator's Report to the Committee.

B—The Constitution of the L.M.B.C., and the Laboratory Regulations.

C—The Acting Hon. Treasurer's Statement (which will be found at p. 52), with the usual List of Subscriptions and Balance Sheet.

D—Illustrated Notes on Manks Antiquities, by P. M. C. Kermode and W. A. Herdman.

APPENDIX A.

CURATOR'S REPORT TO THE COMMITTEE.

The work of the past year has been marked by a substantial increase in the number of University Students who have visited the Station for the purpose of study and research, and by the successful inauguration of fish hatching. Owing to the large demands made upon my time by the hatchery work, I was unable to conduct the Easter Class for School Teachers, but my place was ably filled by Mr. F. J. Cole, and the class was quite successful, in spite of the small number of students in attendance. Our laboratory accommodation was somewhat severely taxed during the month of April, which included the Easter vacation, but no serious inconvenience was experienced either by workers or staff.

The hatching season was practically over by the end of the first week in May, by which time large numbers of plaice larvæ were seen swimming actively at or near the surface in the spawning pond. On May 20th some of these larvæ were examined under the microscope by Prof. Herdman, and their stomachs were seen to contain Copepoda. By the middle of June many had passed through their metamorphosis, and had made their way to the bottom of the pond, and when the pond was emptied during the last week in September they were found to have attained an average length of 1½ to 2 inches, while some few reached 4 inches. A number of berried lobsters were acquired during the winter months and kept in the large concrete tank, with their eggs intact, until a few weeks before the beginning of the lobster hatching season, when, as has been the case elsewhere, all the eggs disappeared, whether eaten by the adult lobsters or simply shed could not be ascertained. However, a few more berried females, with nearly ripe eggs, were brought in by fishermen, and from these 5,000 larvæ were successfully hatched out. In spite of the exercise of every care numbers died during the shell-casting periods, and very few survived to attain the "lobsterling" stage. It is worthy of note that the female spiny lobster, *Palinurus vulgaris*, destroys her eggs in captivity. The specimens in our Aquarium tanks are frequently seen to comb the bunches of eggs with the claws of the last pair of thoracic appendages, and finally all the eggs disappear.

With a view of adding to our stock of adult plaice for spawning purposes, and making the collection of fishes in the Aquarium tanks more representative, a trammel net, 20 fathoms long, was purchased in July, and has been used on almost every suitable day since. The result was so satisfactory that a second net, 30 fathoms long, was purchased in September. In addition to 118 plaice, many of which ranged from 16 to 22 inches in length, various other fish have been caught, including dog-fish, thornback ray, cod, pollack, coal-fish, gurnard, mackerel, conger, angler, wrasse, sole, lemon sole, and dab. The nets have not only added materially to our stock of fish, but have afforded a useful and interesting indication of the species frequenting the bay and neighbourhood during the time they have been in use. In this connection it may be mentioned that a mackerel was caught on November 1st, a late date for this fish in this part of the Irish Sea.

During the first fortnight in August enormous numbers of young herrings, from 2 to 3 inches in length, were left stranded by almost every receding tide on the Manx coast. It was found that they were being pursued and eaten by the shoals of pollack, coal-fish, and mackerel which always frequent the coast at that time of the year, and so eager and relentless was the pursuit that many of these fish were caught in quite shallow water in Port Erin Bay. The stomach of a pollack caught in the trammel net was found gorged with young herrings.

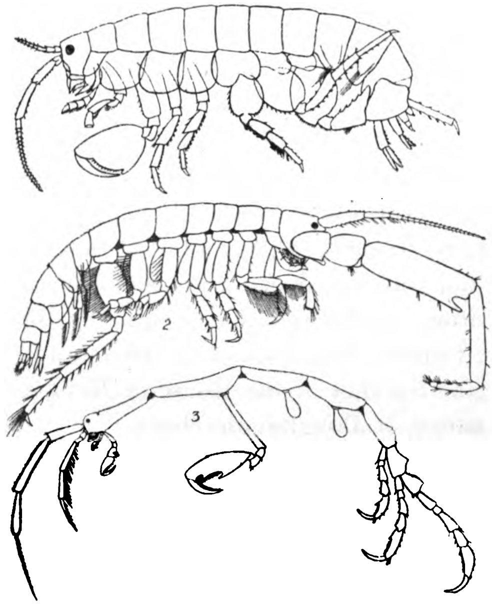
Tow nettings have been taken at intervals throughout the year. Whenever possible the organisms were examined alive immediately after capture, but the more detailed examination, especially of the Copepoda, has this year been undertaken by Mr. A. Scott, who will submit an independent report.

Faunistic work was carried on by most of the University Students, several of whom will contribute notes on points of special interest. Additions continue to be made, by purchase and donation, to the stock of books and reprints in the Library; but such valuable publications as the Quarterly Journal of Microscopical Science and the Journal of the Royal Microscopical Society and many foreign journals are still a much felt want.

The Station has been visited during the year by his Excellency the Lieutenant-Governor of the Isle of Man, Lord Raglan, who has shown his interest in the work of the Institution by repeated visits; also by Sir J. West Ridgeway, formerly Governor of the island, and Sir Alan Perry, by the Speaker of the House of Keys, the Mayor and Corporation of Douglas, the Town Commissioners of Peel, Ramsey, and Castletown, and by the Isle of Man Fishery Board, by Professor and Mrs. Lyman Clark, of Michigan, U.S.A., the Lord Bishop of Liverpool and Mrs. Chavasse, Dr. Gustav Eisen, of San Francisco, Mr. Edgar Thurston, of Madras, and Masters and Boys from King William's College. Lastly, the Isle of Man Natural History and Antiquarian Society held one of their ordinary meetings, under the presidency of Lord Raglan, in the Lecture Room of the Biological Station on September 15th, when Prof. Herdman delivered an address on "Pearl Oysters and the formation of Pearls." During the Easter vacation Dr. and Mrs. Bailey, of Port Erin, repeated their kind invitation of last year to all our workers, and a most enjoyable evening was spent in examining Dr. Bailey's collection of Manx Beetles.

Port Erin, Nov., 1904. H. C. Chadwick.

1 Orchestia littorea 2 Corophium grossipes
3 Caprella linearis



APPENDIX B.

THE LIVERPOOL MARINE BIOLOGY COMMITTEE (1904).

HIS EXCELLENCY THE RIGHT HON. LORD RAGLAN, Lieut.-Governor of the Isle of Man.
MR. R. D. DARBISHIRE, B.A., F.G.S., Manchester.
PROF. R. J. HARVEY GIBSON, M.A., F.L.S., Liverpool.
MR. W. J. HALLS, Liverpool.
PROF. W. A. HERDMAN, D.Sc., F.R.S., F.L.S., Liverpool, Chairman of the L.M.B.C., and Hon. Director of the Biological Station.
Dr. W. E. HOYLE, M.A., University, Manchester.
MR. P. M. C. KERMODE, Ramsey, Isle-of-Man.
MR. A. LEICESTER, Liverpool.
SIR CHARLES PETRIE, Liverpool.
DR. ISAAC ROBERTS, F.R.S. (the late).
MR. A. O. WALKER, F.L.S., J.P., formerly of Chester.
MR. ARNOLD T. WATSON, F.L.S., Sheffield.

Curator of the Station—MR. H. C. CHADWICK.
Assistant—Mr. T. N. CREGEEN.

CONSTITUTION OF THE L.M.B.C.

(Established March, 1885.)

I.—The OBJECT of the L.M.B.C. is to investigate the Marine Fauna and Flora (and any related subjects such as submarine geology and the physical condition of the water) of Liverpool Bay and the neighbouring parts of the Irish Sea and, if practicable, to establish and maintain a Biological Station on some convenient part of the coast.

II.—The COMMITTEE shall consist of not more than 12 and not less than 10 members, of whom 3 shall form a quorum; and a meeting shall be called at least once a year for the purpose of arranging the Annual Report, passing the Treasurer's accounts, and transacting any other necessary business.

III.—During the year the AFFAIRS of the Committee shall be conducted by an HON. DIRECTOR, who shall be Chairman of the Committee, and an HON. TREASURER, both of whom shall be appointed at the Annual Meeting, and shall be eligible for re-election.

IV.—Any VACANCIES on the Committee, caused by death or resignation, shall be filled by the election at the Annual Meeting, of those who, by their work on the Marine Biology of the district, or by their sympathy with science, seem best fitted to help in advancing the work of the Committee.

V.—The EXPENSES of the investigations, of the publication of results, and of the maintenance of the Biological Station shall be defrayed by the Committee, who, for this purpose, shall ask for subscriptions or donations from the public, and for grants from scientific funds.

VI.—The BIOLOGICAL STATION shall be used primarily for the Exploring work of the Committee, and the SPECIMENS collected shall, so far as is necessary, be placed in the first instance at the disposal of the members of the Committee and other specialists who are reporting upon groups of organisms; work places in the Biological Station may, however, be rented by the week, month, or year to students and others, and duplicate specimens which, in the opinion of the Committee, can be spared may be sold to museums and laboratories.

LIVERPOOL MARINE BIOLOGICAL STATION
AT
PORT ERIN.

Laboratory Regulations.

I.—This Biological Station is under the control of the Liverpool Marine Biological Committee, the executive of which consists of the Hon. Director (Prof. Herdman, F.R.S.) and the Hon. Treasurer.

II.—In the absence of the Director, and of all other members of the Committee, the Station is under the temporary control of the Resident Curator (Mr. H. C. Chadwick), who will keep the keys, and will decide, in the event of any difficulty, which places are to be occupied by workers, and how the tanks, boats, collecting apparatus, &c., are to be employed.

III.—The Resident Curator will be ready at all reasonable hours and within reasonable limits to give assistance to workers at the Station, and to do his best to supply them with material for their investigations.

IV.—Visitors will be admitted, on payment of a small specified charge, at fixed hours, to see the Aquarium and Museum adjoining the Station. Occasional public lectures are given in the Institution by members of the Committee.

V.—Those who are entitled to work in the Station, when there is room, and after formal application to the Director, are:—(1) Annual Subscribers of one guinea or upwards to the funds (each guinea subscribed entitling to the use of a work place for three weeks), and (2) others who are not annual subscribers, but who pay the Treasurer

10s. per week for the accommodation and privileges. Institutions, such as Colleges and Museums, may become subscribers in order that a work place may be at the disposal of their students or staff for a certain period annually; a subscription of two guineas will secure a work place for six weeks in the year, a subscription of five guineas for four months, and a subscription of £10 for the whole year.

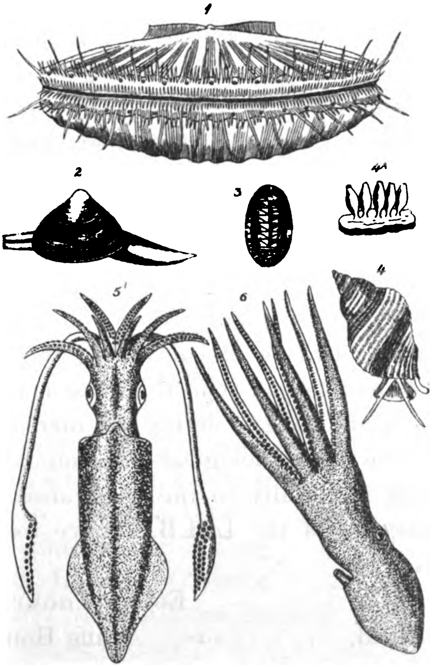
VI.—Each worker is entitled to a work place opposite a window in the Laboratory, and may make use of the microscopes, reagents, and other apparatus, and of the boats, dredges, tow-nets, &c., so far as is compatible with the claims of other workers, and with the routine work of the Station.

VII.—Each worker will be allowed to use one pint of methylated spirit per week free. Any further amount required must be paid for. All dishes, jars, bottles, tubes, and other glass may be used freely, but must not be taken away from the Laboratory. Workers desirous of making, preserving, or taking away collections of marine animals and plants, can make special arrangements with the Director or Treasurer in regard to bottles and preservatives. Although workers in the Station are free to make their own collections at Port Erin, it must be clearly understood that (as in other Biological Stations) no specimens must be taken for such purposes from the Laboratory stock, nor from the Aquarium tanks, nor from the steam-boat dredging expeditions, as these specimens are the property of the Committee. The specimens in the Laboratory stock are preserved for sale, the animals in the tanks are for the instruction of visitors to the Aquarium, and as all the expenses of steam-boat dredging expeditions are defrayed by the Committee, the specimens obtained on these occasions must be retained by the

Committee (*a*) for the use of the specialists working at the Fauna of Liverpool Bay, (*b*) to replenish the tanks, and (*c*) to add to the stock of duplicate animals for sale from the Laboratory.

VIII.—Each worker at the Station is expected to lay a paper on some of his results—or at least a short report upon his work—before the Biological Society of Liverpool during the current or the following session.

IX.—All subscriptions, payments, and other communications relating to finance, should be sent to the Hon. Treasurer. Applications for permission to work at the Station, or for specimens, or any communications in regard to the scientific work should be made to Professor Herdman, F.R.S., University, Liverpool.



Mollusca, from Port Erin.

APPENDIX C.

HON. TREASURER'S STATEMENT.

As usual, the list of subscribers and the balance sheet are appended, the latter showing a small balance in favour of the Committee. The Report of the Director clearly indicates the necessity there is for increased support by annual subscriptions or special donations, now that the commodious, but more expensive, new Biological Station is in full occupation, and that further fields of useful work are opening up before the Committee.

Professor Herdman reports that no further donations have been made during the year to the special fund for publishing the Marine Biological Memoirs. Several excellent Memoirs are nearly ready for publication, and contributions for this object will be gladly received by Professor Herdman.

The library for the use of students and workers at the Port Erin Station is urgently in want of many standard Biological works. Further donations towards the library, either in books or money, will be most welcome.

The Treasurer will gladly receive the names of new subscribers with the view of continuing the publications on the local Fauna and on typical British marine animals and plants, and of aiding to defray the increased working expenses at the new Biological Station, and of thus further adding materially to the work already achieved under the auspices of the L.M.B.C. since its foundation nineteen years ago.

EDWIN THOMPSON,
Acting Hon. Treasurer.

53, Croxteth Road,
Liverpool, December, 1904.

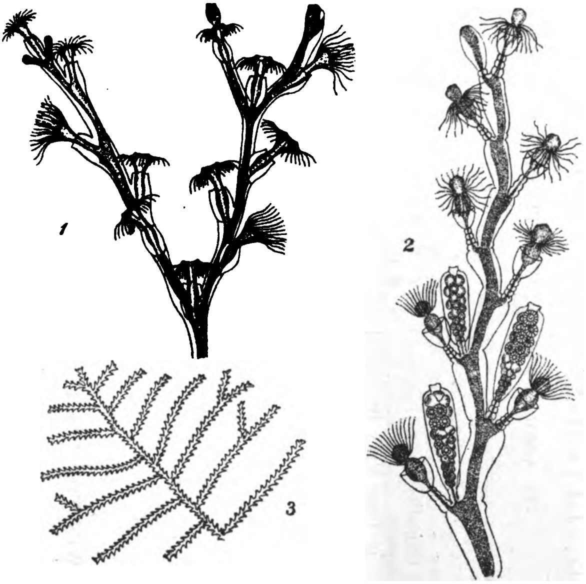
SUBSCRIBERS.

	£	s.	d.
Beaumont, W. I., Citadel Hill, Plymouth ...	1	1	0
Bickersteth, Dr., 2, Rodney-street...	2	2	0
Brown, Prof. J. Campbell, University, Liverpool..	1	1	0
Browne, Edward T., B.A., 141, Uxbridge-road, Shepherd's Bush, London	1	1	0
Boyce, Prof., University, Liverpool	1	1	0
Brunner, Mond & Co., Northwich...	1	1	0
Brunner, Sir J. T., Bart., M.P., Liverpool ...	5	0	0
Clague, Thomas, Bellevue Hotel, Port Erin ...	1	1	0
Clubb, J. A., Public Museums, Liverpool... ...	0	10	6
Crellin, John C., J.P., Andreas, I. of Man... ...	0	10	6
Crosfield, Harold G., Fulwood Park, Liverpool ...	1	1	0
Dale, Principal, University, Liverpool	1	0	0
Dixon-Nuttall, F. R., J.P., F.R.M.S., Prescot ...	2	2	0
Gair, H. W., Smithdown-rd., Wavertree ...	2	2	0
Gamble, Sir David, C.B., St. Helens	2	0	0
Gaskell, Holbrook, J.P., Woolton Wood... ...	1	1	0
Gossage, Fred. H., Camp Hill, Woolton	5	0	0
Halls, W. J., 35, Lord-street	1	1	0
Headley, F. W., Haileybury College, Hertford ...	1	1	0
Herdman, Prof., University, Liverpool	2	2	0
Hewitt, David B., J.P., Northwich	1	1	0
Holland, Walter, Carnatic Hall, Mossley Hill ...	2	2	0
Holt, Alfred, Crofton, Aigburth	2	2	0
Holt, Mrs., Sudley, Mossley Hill	2	2	0
Holt, P. H., Croxteth-gate, Sefton-park	1	1	0
Holt, R. D., 54, Ullet-road, Liverpool	2	0	0
Hoyle, Dr. W. E., Museum, Owen's College ...	1	1	0
Isle of Man Natural History Society	1	1	0
Jarmay, Gustav, Hartford, Cheshire	1	1	0
Jones, Charles W., J.P., Allerton Beeches ...	1	0	0
Forward	£47	10	0

	£	s.	d.
Forward	47	10	0
Lea, Rev. T. Simcox, Leek Vicarage, Kirkby Lonsdale	1	1	0
Leicester, Alfred, Scott Dale, New Ferry	1	1	0
Lewis, Dr. W. B., W. Riding Asylum, Wakefield	1	0	0
Manchester Microscopical Society	1	1	0
Meade-King, R. R., 4, Oldhall-street	0	10	6
Melly, W. R., 90, Chatham-street	1	1	0
Monks, F. W., Warrington	2	2	0
Muspratt, E. K., Seaforth Hall	5	0	0
Okell, R., B.A., F.L.S., Sutton, Douglas, I. of Man	1	1	0
Paterson, Prof., University, Liverpool	1	1	0
Petrie, Sir Charles, Devonshire-road	1	1	0
Pilkington, J. A., Bank House, Maghull	0	10	0
Rathbone, Mrs. Theo., Backwood, Neston	1	1	0
Rathbone, Miss May, Backwood, Neston	1	1	0
Rathbone, W., the late, Greenbank, Allerton	2	2	0
Roberts, Dr. Isaac, the late, F.R.S., Crowborough, Sussex	1	1	0
Rae, Edward, Courthill, Birkenhead	1	1	0
Simpson, J. Hope, Aigburth-drive	1	1	0
Smith, A. T., 43, Castle-street	1	1	0
Sorby, Dr. H. C., F.R.S., Broomfield, Sheffield	1	1	0
Talbot, Rev. T., Douglas, Isle of Man	1	1	0
Thornely, The Misses, Aigburth-Hall-rd.	1	1	0
Timmis, T. Sutton, Cleveley, Allerton	2	2	0
Toll, J. M., 49, Newsham Drive, Liverpool	1	1	0
Walker, Alfred O., Ulcombe Place, Maidstone	3	3	0
Walker, Horace, South Lodge, Princes-pk.	1	1	0
Walker, W. H. & Co., Douglas	1	1	0
Watson, A. T., Tapton-crescent, Sheffield	1	1	0
Weiss, Prof. F. E., Owens College, Manchester	1	1	0
Wiglesworth, Dr., Rainhill	1	1	0
Yates, Harry, 75, Shude-hill, Manchester	1	1	0
Yates, Peter P., Grand Hotel, Douglas	1	1	0
	£89	3	6

SUBSCRIPTIONS FOR THE HIRE OF "WORK-TABLES."

Victoria University, Manchester	£10	0	0
University, Liverpool	10	0	0
Birmingham University	10	0	0
	£30	0	0



Port Erin Zoophytes.

THE LIVERPOOL MARINE BIOLOGY COMMITTEE.

Dr. IN ACCOUNT WITH EDWIN THOMPSON, ACTING HON. TREASURER. **Cr.**

1904.	£	s.	d.
To Printing and Stationery	32	8	0
,, Expenses of Dredging Expeditions	2	5	0
,, Boat Hire and Boat Repairs	3	12	0
,, Books and Apparatus at Port Erin Biological Station	24	8	9
,, Postage, Carriage, &c.	2	9	1
,, Salary, Curator	75	0	0
,, ,, Assistant	27	6	0
,, Sundries	7	11	6
,, Balance in Bank	1	13	9
	£176	14	1

EDWIN THOMPSON

ACTING HON. TREASURER.

LIVERPOOL, *December 31st, 1904.*

1904.	£	s.	d.
By Balance in Bank (Dec. 31st, 1903)	4	1	2
,, Subscriptions and Donations received	79	4	0
,, Amount received from Universities for hire of "Work Tables"	30	0	0
,, Dividend, British Workman's Public House Co., Ltd., Shares	6	8	9
,, Sale of Nat. Hist. Specimens	0	12	3
,, Interest on British Association (1896) Fund	38	1	8
,, Bank Interest	0	7	7
,, Laboratory and Class Fees	8	19	0
,, Sale of Guides	8	1	3
,, Sale of Bottles, &c.	0	18	5
	£176	14	1

Endowment Invested Fund:—
British Workman's Public House Co.'s shares £173 1 0

Audited and found correct,

A. T. SMITH.

ILLUSTRATED NOTES

ON

MANKS ANTIQUITIES

P. M. C. KERMODE & W. A. HERDMAN
F.S.A., Scot. D.Sc., F.R.S.

LIVERPOOL
1904

[*ALL RIGHTS RESERVED.*]

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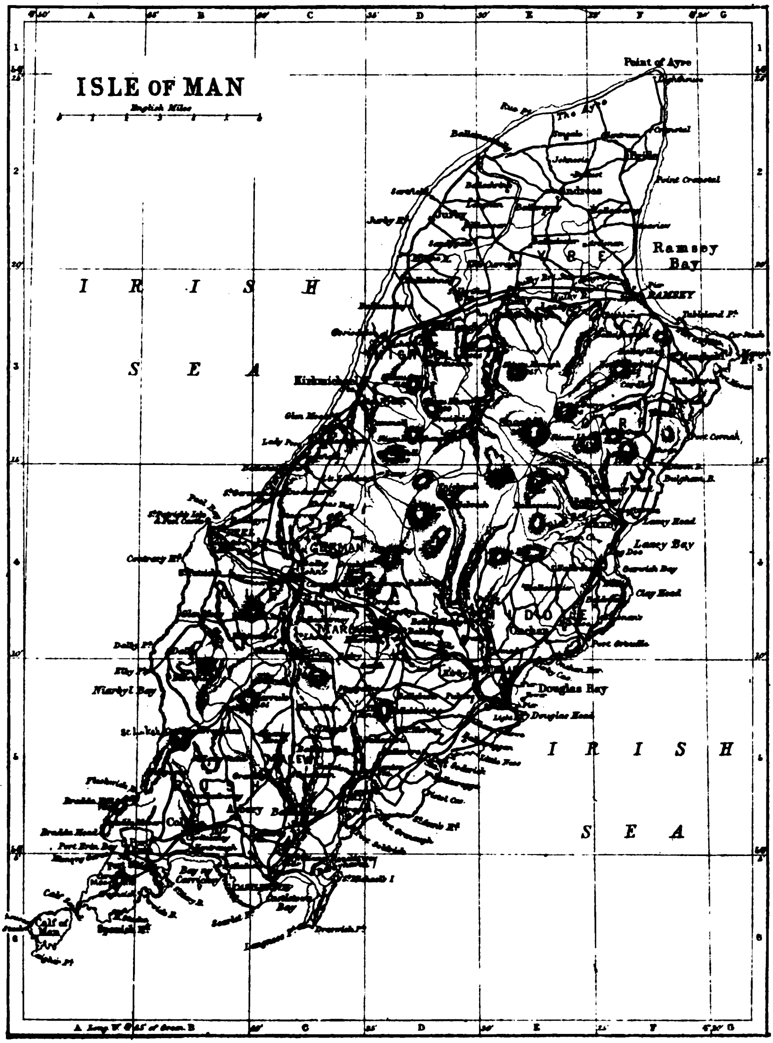
ISLE OF MAN
English Miles
Point of Ayre
Ramsey Bay
RAMSEY
I R I S H
S E A
Kirkmichael
Laxey Bay
Douglas Bay
Douglas Head
Niarbyl Bay
Calf of Man
I R I S H
S E A

Fig. 1.

PREFACE.

On a prominent shoulder of the Meayll Hill, overlooking Port Erin Bay and facing Bradda Head, stands one of the most remarkable monuments of antiquity—a circle of stone cists of late Neolithic or early Bronze age, so curious in the arrangement of its parts that it appears to be unique in the British Islands, and is probably only paralleled, but scarcely equalled, by certain burial mounds in Scandinavia.

Some twelve years ago, recognising the important nature of this relic of prehistoric times, and struck with the incorrectness or inadequacy of the brief references made to it in archæological works, we devoted some time and trouble to a systematic examination of the site, and published a pamphlet, in December, 1893, giving an account of our excavations, with illustrative plates. A couple of years later we made an exploration of the ancient hut village that lies in the "Hollow of Botheration" (Lag ny Boirey) further down the hill; and after the Liverpool meeting of the British Association in September, 1896, we took a party of distinguished archæologists—Prof. Montelius, Dr. Munro, Prof. Haddon and others—to see the results of our labours. Parts of the excavations were still open, and the curious symmetry in the arrangement of the stones excited considerable interest, and some discussion as to probable age and the relationship to other megalithic monuments elsewhere. The importance of the Manks prehistoric remains in relation to Scandinavian antiquities was obvious during the four or five days that our friends were able to devote to a rapid survey of the Island; and we were pressed then, and on many occasions since, to extend our observations to other parts of the ground and to earlier and later traces of human life and work.

The pamphlet on the Meayll stone circle has been long out of print and is often asked for, the single copy at the Port Erin Biological Station is frequently borrowed by students working at the Institution, and the Curator—Mr. Chadwick—informs us that from the applications made to him by visitors it is clear that if the work were reprinted there would be a considerable demand for it.

As we have for some years taken every opportunity that offered of exploring the antiquities of the Island, and as a considerable accumulation of unpublished notes and drawings is now in our hands, we have decided while reprinting our account of the stone circle on the Meayll, to let that monument now take its proper place in the series, and, by adding some description of the still earlier and the later prehistoric and eohistoric Manks remains, to form what we hope may prove a useful illustrated introduction to local archæology.

P. M. C. K.
W. A. H.

Port Erin,
December, 1904.

ILLUSTRATED NOTES

ON

MANKS ANTIQUITIES.

THE Isle of Man is interesting from various points of view, and many of the more or less scientific summer visitors to its shores must often have found intellectual delights in its marine biology and its botany, in its rocks and fossils and in tracing the survival of ancient customs and the still earlier remains of prehistoric Man. The past history of the land and the people is so constantly and so prominently brought before the eye and the imagination by Tynwald Hill and Rushen Castle, by early Celtic and Scandinavian carvings, by ruined "keeils" and holy wells, by tumulus and standing stone, by cup-markings, archaic pottery and fields of chipped flint, leading back to the remains of extinct animals and the work of the great ice-age, that the observer naturally desires some guide which will enable him to place and classify, however imperfectly, these ancient records from the soil and the rocks. Although these unwritten records may not enable us to form anything approaching a complete and satisfying history, they yield welcome glimpses into the past state of our land, and show us something of the habits of races that have contributed to our ancestry.

Archæology traced back to its beginnings merges into Geology; and we find on examination that the Isle of Man has been a land-mass since very early geological times. The precise age of the oldest stratified rocks forming the foundation of the island is very difficult to determine owing to the absence of undoubted fossil remains and the alterations due to heat, pressure and earth movements. The "Manx slates" which build up its backbone from Bradda Head to North Barrule (fig. 1, Map) are however certainly not later than Lower Silurian, and are placed by Mr. Lamplugh in his recent Memoir* as Upper Cambrian, with a query; and this central ridge which constitutes the mountain ranges seems to have been an insulated mass even as early as the beginning of the Carboniferous period. "This prototype of the present island appears afterwards to have been enfolded and obliterated by the sediments of later times; but with the process of denudation the old ridge has once more emerged from beneath this mantle." The physical features of the district, such as are necessary for an understanding of the past history, can best be given by quoting a few paragraphs from Chapter I. of Mr. Lamplugh's authoritative Memoir, as follows:—

"Its insular character is as well maintained in its physical as in its geological features. The erosive agency of the simple drainage system descending radially to the sea from the central hill-range, together with that of the waves which surround it, is adequate to explain all the contours of its present surface. It must indeed frequently during its history have been re-united to the mainland by a continuous land surface; but at such times it probably still retained in some degree its characteristic individuality, and arose above the surrounding plain as a hilly tract with a self-contained drainage, although its streams may then have been tributary to a larger river-system lying beyond its limits."

---

* The Geology of the Isle of Man, by G. W. Lamplugh: Memoirs of the Geological Survey, 1903.

"The sketch map, fig. 2, will serve to recall the position of the Island as regards the neighbouring shores. Its northernmost point is 16 miles distant from the nearest headland of the Scottish coast, while its closest approach to the Cumberland shore is 31 miles, to that of Ireland in Co. Down 31 miles, and to the Welsh coast near Holyhead 45 miles. The same map shows roughly the contours of the surrounding sea-bottom. To the eastward of the Island the depth is nowhere more than 20 fathoms, to the northward it rarely reaches 30 fathoms, to the southward it

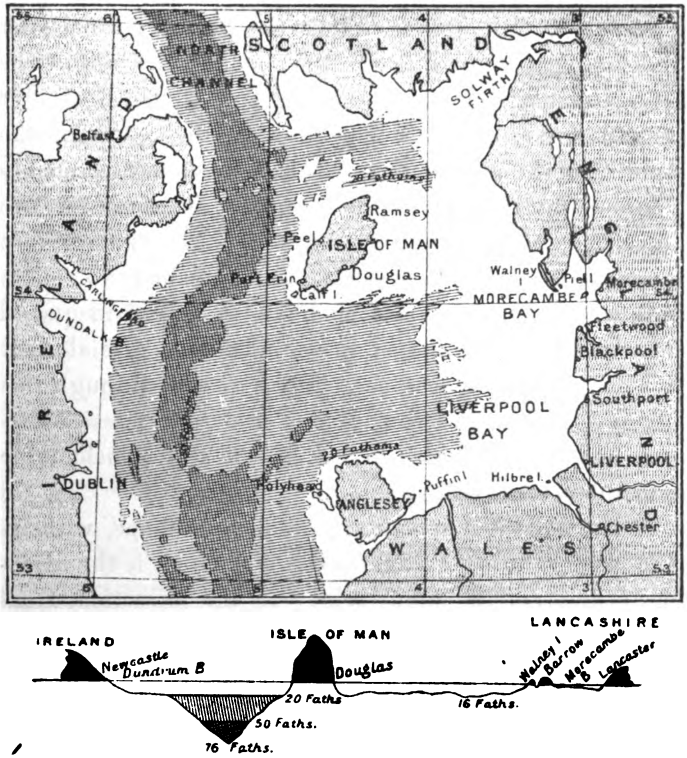

FIG. 2.—Sketch Map and Section of the Irish Sea-Basin (Prof. W. A. Herdman, Report Brit. Assoc., 1896).

usually ranges between 30 and 50 fathoms, while to the westward midway to the Irish coast there is a long narrow trough descending to over 70 fathoms."

"As at present constituted, the Island, with the detached islet of The Calf off its south-western extremity, contains 227 square miles (140,325 acres), of which 170 square miles, or three-fourths of the whole, are occupied by the slate and greywacke rocks, probably of Upper Cambrian age, composing the hilly massif. Strata of the Lower Carboniferous age occur in a small basin of 7 or 8 square miles at a low elevation in the South of the Island, and a narrow strip of red sandstone, probably belonging to the same period, borders the coast for two miles about midway upon the western side. The northern extremity consists of a low-lying tract of about 45 square miles, which is an addition made to the Island in glacial times by the deposition of great masses of glacial drift upon the pre-glacial sea-floor. Deep borings through this drift have recently revealed a rock-floor of Triassic, Permian, and Lower Carboniferous strata at a considerable depth below sea-level."

"The Island is irregularly oblong in shape, with its longer axis running N.N.E. to S.S.W., which is the direction of strike of the slate rocks. In this direction, from the Point of Ayre to Spanish Head, the land has a length of 30 miles, while the breadth of its wider central portion varies from 8 to 12 miles. Excepting in the well-cultivated northern plain there is little flat ground. In the interior the physical features bear much resemblance to the southern uplands of Scotland. The hills are steep, but not generally craggy, and are arranged in long grassy or heather-covered ridges running with the longer axis of the Island, with broad intervening valleys. The highest of these ridges commences in the vicinity of the eastern coast near Ramsey, and is practically continuous to the south-western coast north of Port Erin, but is broken across in one place by a deep transverse valley, which intersects the Island between Peel and Douglas. North Barrule, with an altitude of 1,840 feet, forms the north-eastern extremity of this ridge, which culminates 3½ miles farther south-westward in Snaefell, the highest point of the Island, with an elevation of 2,034 feet, while Cronk-ny-Arrey-Lhaa overhanging the south-western coast, is 1,449 feet in height."

"Most of the larger streams of the Island rise in the vicinity of Snaefell and fall outward in different directions to the sea, the Sulby river and Glen Aldyn water draining northward, the Corna and the Laxey rivers eastward, the Glass and the Baldwin south-eastward, and the Neb south-westward. The drainage of the smaller tract south of the transverse valley is radial from a separate centre in the south-western portion of the hill-chain, whence flow the Glen Rushen waters north and north-westward, the Foxdale river northward, and the Santon, the Silverburn, and the Colby southward."

During the Great Ice Age which terminated geological as distinguished from recent times the Island was buried under the mass of conjoined glaciers which filled up the basin of the Irish Sea. In post-glacial times, as the ice-sheet retreated from North-western Europe it left the configuration of the Island much as we see it at the present day.* Its main valleys were in existence long before that period; its hills were doubtless somewhat higher, the volume of water in the streams was greater, and there were lakes of some size, especially in the North, where the broken remains of a large body of water, formed as the ice retreated from the high hills to the north, continued on into historic times in a reduced state as it is mapped in 1595 by Thomas Durham, and by Chaloner in 1656. A former lake is shown also near Castletown draining into the sea at Poyll-Vaaish.

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* See Map, fig. 1, on back of title-page.

In later post-glacial times this land was covered in great part with forests, particularly of oak, fir and hazel, the remains of which, of [illegible] and North [illegible] in the north, may be traced below the present surface, and are of very special interest to us as having possibly been still in existence when Man first made his appearance in our island. Dr. Cumming states* that he had "a celt of the simplest kind found under the peat on the edge of the Curragh near [illegible]. In a meadow adjoining Close Moore, the property of Professor E. Forbes, were found a short time ago a stone axe and sharpening or edge stone a few feet asunder. They lay upon a bed of fine sand covered with a stratum about four feet thick of peat—trunks of oak trees, &c., and over the peat was a bed of blue alluvial clay to the depth of three or four feet." In the same work (p. 1[illegible]), he mentions it as "singular that an oak tree removed from this submerged forest exhibited upon its upper surface the marks of a hatchet"; and further adds, at second hand, that "the foundations of a primitive hut were laid bare, and that therein were some antique uncouth-looking instruments, once the property it may be of the primitive wood-cutters." Again Mr. Jefcott, High Bailiff of Castletown, recorded† his discovery at Strandhall, where pieces of the antlers of the Irish elk had shortly before been found, of "fragments of human skulls and other human bones" in the *débris* of a deep excavation in the sea-beach made by floods. These were associated with a jaw-bone believed by Professor Busk to have been that of a red deer.

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* *The Isle of Man*, by J. G. Cumming (1848), p. 216, footnote.

† Yn Lioar Manninagh, Vol. I., p. 56.

Measured in years, the formation of these forests and peat beds must have spread over a very long period—a time of gradual upheaval by no means confined to this small area, but part of a general movement, to be afterwards followed by a depression of the land throughout Great Britain and Ireland, which carried the ancient forests down in some places to below the present sea-level.

The 10-fathom line around our coast has been considered to be roughly the boundary of the land at the time of greatest elevation. This forest growth has been shown to belong to the Neolithic, or later stone age, by the presence of animals first domesticated, and introduced to our country by Neolithic man, as well as by the absence of the extinct mammalia characteristic of the previous periods. The climate would be necessarily affected by the enlarged area of land, the extended water-system and the growth of forests, and must have been generally more damp, with greater extremes between summer heat and winter cold. It was probably a good deal more favourable to the formation of peat-beds than the conditions seen at the present day.* Associated with the silt at the bottom of these peat-beds we have records of the Great Deer usually known as the "Irish Elk," *Cervus giganteus* (formerly called *Megaceros hibernicus*), a noble animal (see fig. 3) with a spread of antlers extending to over 9 feet,

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* There is reason to believe that during historic times, since the disappearance of the ancient Neolithic forests, trees have been few and of scanty growth over the greater part of the island. Thus, Chaloner (1656) referring to the former plenty as seen in the bog-oak, &c., speaks of the Island as "now destitute of Wood, and of the Plantations which *some few* have made about their houses" (Manx Soc., Vol. X., p. 8). In this connection Dr. Harold Bailey, of Port Erin, has pointed out that there are remarkably few wood-feeding beetles in the island, and that even these may have been introduced of recent years with timber from the main land.

The coming of this large land animal to our Island there is [illegible] [illegible] [illegible] [illegible] [illegible] [illegible], but does not necessarily imply any land connexion with neighbouring countries.

The glacial conditions which during the Ice Age overwhelmed the Isle of Man doubtless exterminated all previous forms of life—both plant and animal. Consequently, after the emergence of the higher part of the Island from the melting ice-sheet both flora and fauna must have been re-introduced from the adjoining lands and ultimately from the Continent of Europe. It was during this time that it is supposed that the Irish Elk may have crossed the retreating and melting ice-fields to reach the present territory of Man, just as its near relation the Reindeer is known to traverse the frozen sea north of Norway, crossing from island to island by ice.*

Remains of the Irish Elk have now been dug up at several different localities in the Island, as at Balla Lavaney, Andreas; Ballaterson, Ballaugh; Close-y-garey, near St. John's; and Strandhall and Kentraugh in the South. Besides Mr. Jefferson's instance quoted above, Cumming mentions† the finding of an axe "with the remains of this animal." Further search may produce still more satisfactory evidence that the elk survived to the period of these peats and forests, and so became a contemporary of our earliest inhabitants of Man.

If so, not only would it form a connecting link between man and the glacial period in this area, but it is of special interest in that "it is the sole survivor from the Pleistocene into the Prehistoric age, which has since become extinct."* A fine example from Close-y-garey, a boggy depression by the north side of the railroad, just half-way between St. John's and Poortown, recovered in 1897 with the co-operation of a Committee appointed by the British Association,† may be seen in the Insular Museum now temporarily located in Castle Rushen (see fig. 3).

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* On the other hand, Lomas (Proc. Liverpool Geol. Soc., 1903-4) believes that on the melting of the Irish Sea glacier a low undulating land connection existed between the Island and Lancashire; and that following the advance of vegetation the Irish Elk may have crossed by means of this lost land.

† Arch. Camb. XI., 3rd Series, p. 429.

These elk remains, where exact details of the sections or layers shown in the excavation are known, have always been obtained " from the lowermost portion of the alluvial deposits, and from beds which contain the first indications of organic life after the emergence of the land from under the ice-sheet," and Lamplugh suggests (Memoir, p. 388) that the elk was an early post-glacial inhabitant and may have reached this island, and even Ireland, across ice-fields when a remnant of the great glacier still occupied the basin of the Irish Sea; and may possibly never have been a permanent resident but only a migratory visitor. "The animal," he adds, "may have lingered on into the age of forests, when the principal peat-bogs of the Island were accumulated, but for this there is at present no positive evidence."

The depression of the land referred to above was followed again by a gradual elevation which Cumming supposes to have continued to the present day, but Lamplugh argues on the contrary that it has in its turn been followed by yet another slight depression. Traces of the last upheaval are marked all round the Island by a well-worn notch on the cliffs and by raised beaches at a height of 10 or 12 feet above present high-water mark. That these beaches, which are later than the forest period, were already formed, or being formed, while the Island

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* See Boyd Dawkins' Early Man in Britain, p. 247, and 257.

† British Assoc. Report for 1898 (Bristol) pp. 548-551.

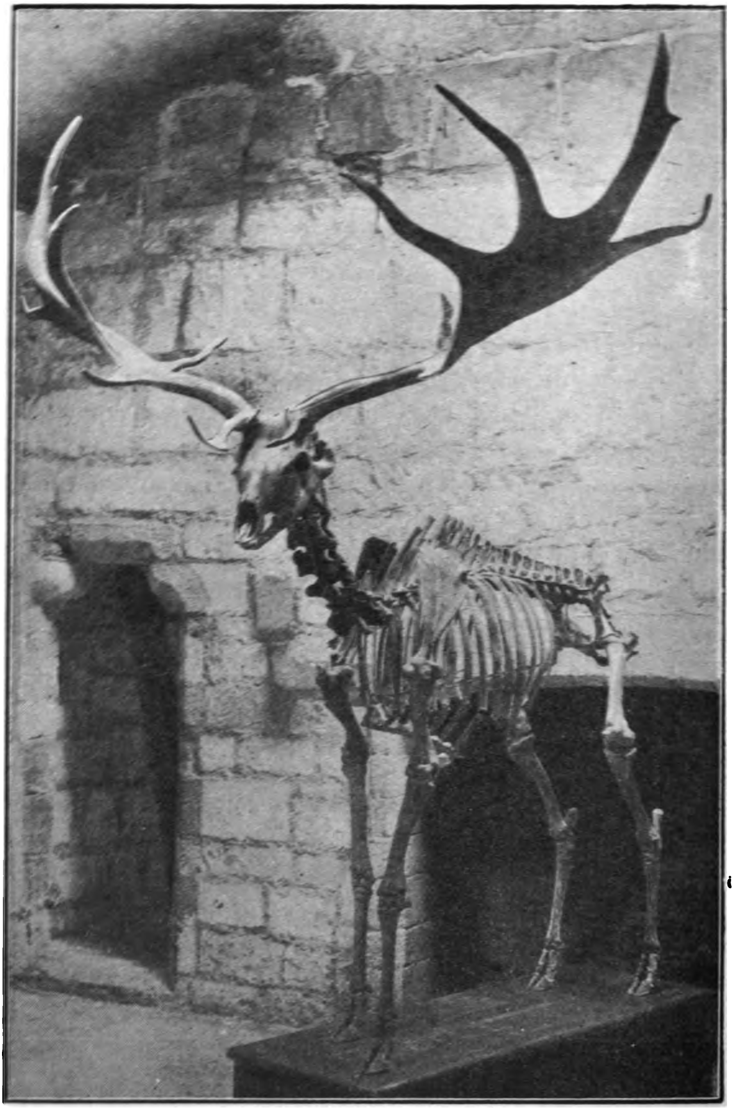

Fig. 3.—Skeleton of Irish Elk from Close-y-garey, St. John's. From a photograph by Mr. G. B. Cowen.

was inhabited by Neolithic man, Lamplugh considers proved by his discovery of worked flints on their surfaces, "some struck into flakes on the spot." Dr. Munro has stated* that the upheaval which caused the similar 25 foot raised beaches in Scotland was completed about the beginning of the bronze age.

It was shown during the second quarter of the nineteenth century, mainly as a result of the labours of the Scandinavian archæologists Thomsen, Nilssen and Worsaae, that a scientific division of prehistoric times in Northern Europe could be made into the three ages of "Stone," "Bronze" and "Iron." Further study of the earliest prehistoric remains, especially in France and England, has led to the recognition by archæologists generally of an older and ruder as distinct from a later stone period, giving us in all the four divisions:—Palæolithic, Neolithic, Bronze and Iron. These successive periods of advancing civilisation bridge the interval between geological and historic times, and a few sentences about the general characteristics of each age may be given before we pass to our notes on the Manks antiquities.

We may recall that at the close of the Tertiary Geological period, in Pleistocene times, Europe as far South as 50° north latitude was covered with a great ice-sheet largely consisting of glaciers which descended the valleys, crept down upon the plains, and even ground their way along the floor of the ocean. Scattered boulders, beds of boulder clay and heaps and ridges of stone, gravel and sand (moraines) are found deposited in various parts of our country as remains of this "ice-age." Man was certainly in Europe and possibly even in Britain, which was then united to the Continent by continuous dry land, before the ice-age; but no remains of that earliest inhabitant have yet been found in the Isle of Man. The so-called "River-drift" man has only left his remains in the South and South-east of England up to about a line drawn from the mouth of the Severn to the Wash, while the rather later "Cave" men extended further up to the North of Yorkshire. These were the men of the Palæolithic Age, when the use of metals was not known and the stone implements were rude and unpolished. These primitive weapons, tools and other remains are found in association with the bones of long extinct animals characteristic of the Pleistocene period, such as the mammoth, the cave bear and cave lion, the bison, a hyæna, and the woolly-haired rhinoceros. No traces of the presence of man at this early period or of any of such extinct mammals have, however, been found in our district.

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* Proc. Roy. Soc. Edinb., Vol. XXV., p. 272.

As Great Britain became severed from the Continent before the next race of men, those of the Neolithic Age, spread over the country these must have arrived by sea; and as Man has been an island since even earlier times the successive waves of immigration which swept across from East to West must all have reached our shores by boat—unless, as Lomas has suggested, the sandy coast of North Lancashire may possibly have extended in prehistoric times by way of the Bahama banks to the Point of Ayre.

The Neolithic or later Stone Age man was of that non-Aryan pre-Celtic race which is usually called Ivernian or Iberian, and is supposed to be related to the Basques of the South of France and Spain. It is doubtful whether Palæolithic man has left any descendants in our islands, but there is probably a considerable amount of Neolithic blood in the western parts of Britain. Man of the later Stone Age, when the next wave of immigration arrived, was no doubt driven back, but was probably assimilated rather than exterminated by the Celtic invaders from the East, who brought with them a knowledge of working in copper and inaugurated the age of bronze. The characteristic weapons and implements of the Neolithic Age are made of flint and other hard stone, usually finely chipped and ground at the edges, and sometimes polished with a beautiful finish. Most of the implements, however, were not polished, and the axe-heads are rarely perforated. The art of making pottery was known, spinning and weaving were practised, and all our common farm animals were domesticated.

Neolithic man in this country was small, averaging, it is calculated from the bones, about 5 feet in height, and had a long narrow (dolichocephalic) skull. The type is thought to be still recognisable amongst the smaller, dark Manks people; and the worship of "holy" wells, and the reverence for the tumulus and the standing stones may be regarded as a survival from these far back pre-Aryan times.

There seems reason to believe that the use of copper spread in late Neolithic times from Cyprus along the shores of the Mediterranean to Western Europe; but the coming of copper and bronze to Britain is usually associated with invasion of the country by an Aryan race, the Celts, who were taller than the Neolithic inhabitants, and had rounded (brachycephalic) skulls. The finest types of polished stone implements were made in this age along with the bronze weapons and tools that characterised it.

The Celtic tribes that invaded the West of Europe at the end of the later Stone Age have been divided into an earlier "Goidelic" (the Gaedhils of Ireland, Scotland and the Isle of Man) and a later "Brythonic" wave, separated possibly by centuries. The Goidels probably absorbed more of the blood of their non-Aryan predecessors and gave rise to those northerly and western Celtic nations that speak a Gaelic tongue: while the later Brythons became the more southerly peoples of Wales, Cornwall and Brittany. The Celtic element in the Isle of Man is Goidelic, and that with its Neolithic strain forms the basis of the Manks people, reinforced later on by a strong Scandinavian influence.

For the bearing of the local folklore upon prehistoric questions, the reader should refer to Mr. A. W. Moore's book, "Folklore of the Isle of Man": but we may briefly state here that the many stories of encounters between mortals and fairies or gnomes inhabiting the caves or the earth between men with swords and demons with magic spells are supposed to be the relics of traditions handed down as to the real struggles between the invading Celts with bronze weapons and the pre-Aryan Neolithic inhabitants. There is some evidence, given by Moore and others, that the conquering Goidelic Celts were "impressed by the nature worship of their predecessors, and feared them as being gifted with magic powers." So, we are told, Mannanan Mac Lir, the non-Aryan magician, "kept by necromancy the Land of Mann under mists": and, when routed by St. Patrick, according to the Manks legends, he and his people being of small stature "became fairies and lived in the ancient tumuli, using flint arrow heads as the weapons with which they avenged their wrongs on human beings."*

The fourth or Iron Age was a late Celtic period which extends into historic times. Just as stone weapons were still in common use during the Bronze Age, so we find the iron and bronze periods overlapping in their turn. These are facts of importance which must be borne in mind when discussing loose implements not associated with surroundings which clearly determine their period.

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* Moore, History of the Isle of Man, p. 43.

The majority of the prehistoric remains in the Isle of Man belong to the Neolithic and the Bronze periods, and it may well have been that in this remote and limited area these stages of civilisation may have each persisted on to later times than in other parts of Europe. It is impossible to assign dates for such "ages" in our district, but it may be of interest to note that the Neolithic period is said by Reinach to have extended at Crete from 4500 to 2800 B.C. It probably continued much later in our Western Isles. The knowledge of copper and bronze is supposed to have reached Crete about 2800 B.C., and in France Montelius estimates that the Bronze Age commenced in 2000 and ended about 850 B.C.

The earliest traces of man met with in our district show him to have been then in the Neolithic stage of civilisation.

Structural remains of the period are difficult to identify at first sight, and can only be determined with certainty by careful excavation and examination. They consist of habitations, camps or forts, and burial places. We have also examples of "Neolithic floors or platforms," that is to say, areas of the ancient surface where flint implements of many kinds have been actually manufactured. At the West Craig and the Lagagh in Andreas, at Cass-ny-Hawin, near Ronaldsway, at Ballakaighan, German, and at Port St. Mary, have been found great accumulations of cores, chips, and worked flints of very primitive type.

On the brooghs overlooking Ramsey Mooragh, building operations about 20 years ago disclosed an area, at a depth of from four to six feet below the surface, which was strewn with flint cores from which implements had been made, chips struck off in their fabrication, flakes, knives, scrapers[*] of at least three forms, drills or awls, arrow-heads, and a few stone hammers, with great numbers of broken fragments.[†] All the implements were small, for the most part very rudely formed, though some were rather more finely finished (see fig. 4).

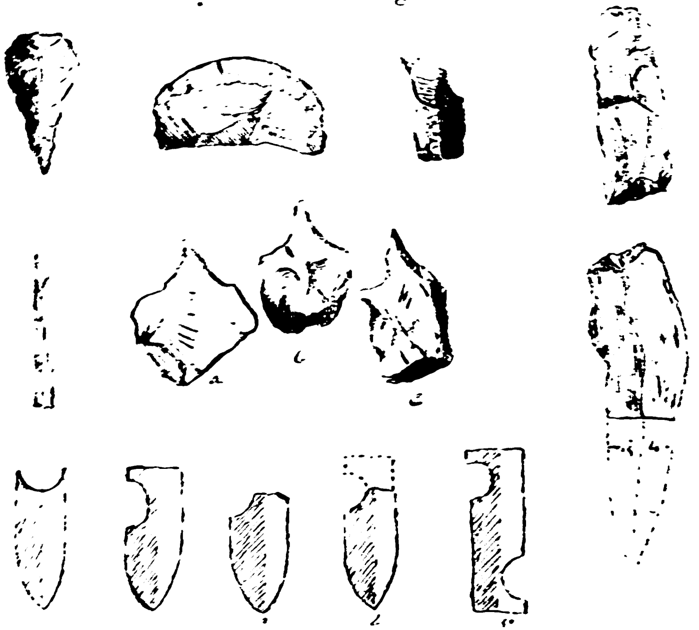

FIG. 4.—Types of Neolithic flint implements.

Three burial places were met with in this area, with fragments of decomposed bones in rude cists; also broken pottery, ashes with traces of calcined and decomposed bone. Some of these remains may possibly have been of Bronze Age, the platform having been apparently occupied for a lengthy period.* No token of village life was discovered, and the place may have served only as a temporary camping ground from time to time.

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[*] In regard to the separation of stone implements into axes, celts, lances, knives, scrapers, awls, &c., it is important to note that Dr. W. E. Roth, writing on the Ethnography of Queensland, says that the modern savage certainly does not recognise these fine distinctions.

In the case of the earlier and ruder forms at least it may well have been that the shape of the detached or chosen fragment was more or less accidental, and it was probably used indifferently for various purposes as was found convenient.

[†] Yn Lioar Manninagh, I., 2, 90, 131, 212.

A somewhat similar floor was discovered in 1899 by the Rev. J. Quine on the left bank of Glen Wyllin, Michael. Great numbers of flint implements have been found here—flakes, scrapers, awls, arrow tips; also hammer-stones showing signs of use, and differing somewhat in type from those at Ramsey. Though no hearth-stones nor hut foundations have been met with, the presence of "fire-holes" would seem to show signs of habitation.

At Rhewyllin, Port St. Mary, Mr. F. Swinnerton discovered another Neolithic floor in 1900, with abundance of shells, decayed human bones, broken hammers, implements of quartz, flint, and slate; arrows, flakes, chips and scrapers.† At the base of the Alfred Pier, Port St. Mary, Mr. Swinnerton had previously found similar remains of a camping ground during the excavations made in forming the roadway. Here he met with decomposed human bones and teeth, bones of rabbit or hare; limpet, periwinkle and dog-whelk shells; a flint arrow-head, scrapers, flakes, and awls, besides some fragments of pottery which he took to be remains of cooking vessels. On this floor were several cists formed of large slabs set on edge, capped originally by a covering stone, typical examples of Neolithic burials (fig. 5).

Though the "floors" referred to show no traces of habitations, we have in places examples of "Hut-circles," or the foundations of primitive dwellings, similar to those met with elsewhere and identified as belonging to this period. A single one of them is clearly traceable in the middle of the high road at Ballaquane, near Dalby. The largest and most interesting collection of such remains is that around the Meayll Hill, near Port Erin, where there are three or four clusters all on a level round the hill with the old village of Cregneash, which it is possible may have been another kept in continuous existence ever since Neolithic or Bronze times. These huts from their contents are evidently in association with the Meayll burial place, a curious circle of cists placed higher up on the same hill, to be described further on. It must be noted, however, that the huts were apparently occupied up to a much later date than that of the stone circle, and, if Neolithic in origin, must belong to the close of that period, which doubtless persisted much later in the Isle of Man than in Britain generally.

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* Yn Lioar Manninagh, I., 2, 262.

† Yn Lioar Manninagh, III., 635.

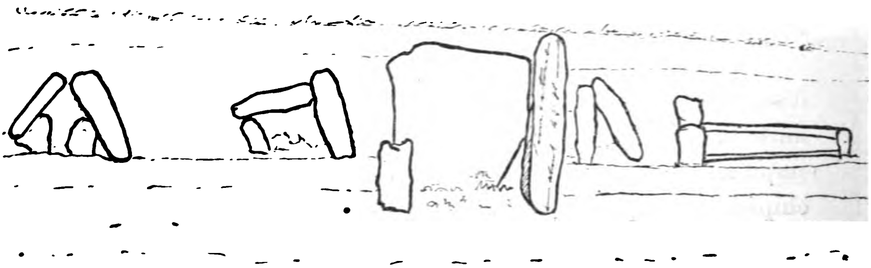

FIG. 5.—Neolithic cists, Port St. Mary. Sketch by F. Swinnerton.

Not far away, on the opposite mountain, at a hollow (known as the Sloc) in the Carnanes on the slope of Cronk-ny-Irree-Laa, is another collection of hut-circles, among which a few worked flints have been found.

In one or two places, as at the foot of Snaefell and at Ballakaighan, German, indications have been met with of pile-structures, reminding one of Boyd Dawkins' description of a log house in Ireland, surrounded by a staked enclosure.* At Ballakaighan these remains were found in association with a bog-oak canoe, hollowed out of a tree trunk; the space around being thickly strewn with rude flint implements, burnt stones, and ashes. (See figs. 7 and 8).

The earth and rubble foundations of numerous camps and small forts are met with around the coast, on craggy rocks in glens, and on hillsides, some of which date from this early period, though no doubt they may have been occupied also much more recently. For example, a small peninsular earthwork at Gob-y-Garvane on the rocky Maughold coast; one on the broogh at Cass-ny-hawin, Santon; Hango Broogh, on a rocky projection between St. Michael's isle and Langness, Malew; and the two Boirranes near Dalby, are instances of coast defences which may have originated in Neolithic times. The earthwork within Peel Castle also, about which have been found many worked flints and a small stone axe, is likely to have been in use from the earliest times, but, neither in this nor the others is there any real indication of date, beyond the small size, the simple plan, and the presence in their immediate neighbourhood of worked flints. Inland, a good example may be seen on an isolated rock at Cashtal Ward, Tromode, and at Ballanicholas, Marown. On hillsides are remains at Ballakilpheric, Rushen, and one on the summit of the curious isolated hill at the entrance to Sulby Glen known as Knock-Sumark.

Finally, we have burials of Neolithic age. In that at Port St. Mary already referred to (fig. 5) were several cists formed of large slabs set on edge, capped originally by a covering stone. On the floors were found crumbling human bones and teeth, flint flakes and implements. Opposite Tynwald Hill, on the Follagh-y-Vannin road, a mound has been cut through, exposing the side and end of a fine stone cist; the hill, or cronk, about 5 feet high and 45 by 60 in diameter, shows in section a layer of rather large, water-worn, white quartz stones over the cist, of which the inside dimensions were 5ft. by 2ft. 7in., and 2ft. 10in. high. It had been paved with smaller rounded white pebbles, from 2in. to 3in. diameter. The bones had crumbled almost to dust. A flint core was met with in the cist, and a rude scraper in the mound above it.*

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* See Early Man in Britain. p. 288.

There are many small tumuli scattered all over the Island. Whether these are Neolithic, Bronze, or even later, cannot be determined from their exterior; and, while some probably belong to this earlier period, the greater number of them which have been examined are shown by their contents to be of the succeeding or Bronze Age. The main distinction lies in the fact that Neolithic burials were by inhumation, the body being seated or doubled up in a cist formed of large slabs of local stone, while in the Bronze period cremation became usual and the incinerated bones were gathered into urns of baked clay, often decorated with characteristic patterns, or, in some cases, were placed in small chambers of slaty stone, different in size and character from the cist of the earlier period. A stone circle on Ballakelly, Santon, may be Neolithic. It consisted of a double circle of large stones of the local Santon granite, set on edge, of which enough remains to show the original plan; in the centre is a cist also of heavy stones on edge—one of the stones of the inner ring is ornamented in one corner by rows of small cup-hollows.† A somewhat similar stone circle with central cist is to be seen on Kerroogarrow, German.

In connection with these burials may be mentioned the Menhirs or Standing Stones, some of which appear to be sepulchral monuments of Neolithic Age. In one case, where two such stones may still be seen, at Ballakilpheric, Rushen, two others are known to have been near them in such a position as to suggest that they formed the remains of a large circle. Worked flints and some rude pottery have been found near by. At Port St. Mary, the "Giant's Casting Stones," close to which worked flints have been found, may perhaps have stood singly. At Glen Mooar, Michael, near the Spooyt-vane, and just above the railroad, is an unhewn stone pillar or Menhir set upright on a little craig facing the sea. At its foot are some cup-hollows cut in the out-cropping rock, and, a little below, on the face of the crag, are larger shallow, basin-like hollows (fig. 6). In some instances such cup-marks appear to have been intended to hold offerings to the dead.*

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* Yn Lioar Manninagh, III., 373,

† Manx Society, Vol. XV. p. 98, and plates.

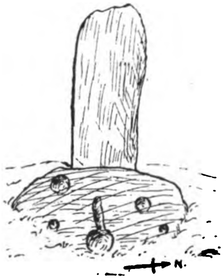

FIG. 6.—Standing stone and cup-marked rock at Michael—from a sketch by P.M.C.K.

Loose objects belonging to the Neolithic period have been found in all parts of the Island, and frequently in or near the monuments already described. Implements of flint are in especial abundance; besides cores and chips, we meet with flakes, knives, and scrapers of three or four different types, drills or awls, arrow-, javelin-, and spear-heads, and celts or axe-heads. A characteristic of the flints is their rudeness and simplicity of make, combined with their small size. The latter is no doubt due to the fact that flint is only found in the Isle of Man in the form of small nodules washed out of the boulder-clay, and it is noticeable that all the Neolithic floors known are on actual deposits of boulder-clay, so as to be close to where the flints naturally occur.

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* The *Times* correspondent "With the Mission to Tibet," August 11th, 1904, describing the Ling-kor, or sacred way, with the 20,000 images of Buddha, refers to "probably the largest 'cup-mark' in the world. There is a smooth worn hole 3ft. or 4ft. deep and 5ft. in length, into which the pious either throw or from which they take away a pebble. The dust at the bottom is of great sanctity, and is much used for charms, and even as an ingredient of the Tibetan pharmacopœia."—(*Times*, August 19th, 1904.)

A very few implements of similar character to those mentioned above have been found formed of quartzite, and even of slate.

Of other materials are some almost unworked pounders, crushers, or hammer-stones, whetstones for grinding and polishing implements, and perhaps some of the spindle-whorls occasionally met with. The polished stone weapons, hammers and axes, or celts, are probably all of foreign make, as shown by the material, such as ophic-calcite, of which they are composed, and which is not found here *in situ*. It is moreover impossible to say with certainty whether such implements reached these parts in the Stone Age or later, for bronze being at all times much more costly and rare, stone no doubt continued long in use, so as to cause considerable overlapping of the periods.

Although some of the more primitive coarse, heavy, and unornamented examples of pottery, not turned by wheel, which have been exposed by agricultural operations, may have belonged to food vessels of this period, it is difficult to discriminate them from those of a later date, and our opinion must be guided by their surroundings and associations.

One or two small and very rudely formed dug-out canoes (fig. 7) seem to belong to this period. The one now in Castle Rushen was found at Tosaby, St. Marks. The most perfect example met with is that found in 1884, at Ballakaighan, German (figs. 7 and 8). It measured just over 14 feet, having at one end 2ft. 3in., and at the other 1ft. 11in. of solid timber; the inside width is about 2ft., tapering to 16in.; the highest part is just 14in., and, inside, 10in. In the thick end a hole is pierced, perhaps for passing a thong or rope of hide through. Many such canoes have been found along the margin of the Clyde about Glasgow, some from "a single oak stem, hollowed out by blunt tools, probably stone axes, aided by the action of fire; a few cut beautifully smooth, evidently with metallic tools. . . . Those most roughly hewn may be relics of the Stone period; those more smoothly cut of the Bronze Age."*

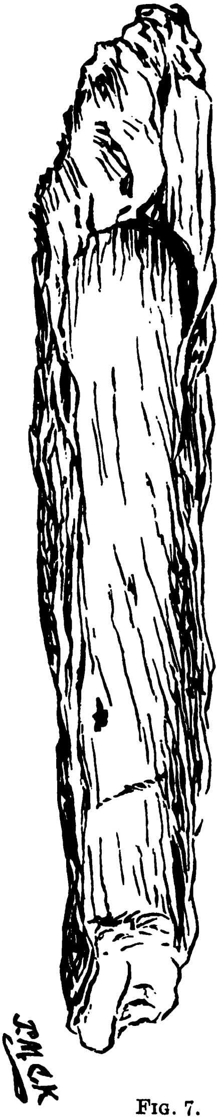

Fig. 7.

The Ballakaighan canoe rested by the south side of a considerable area—about 60 feet by 9 feet, and 5 feet in deepest part—of burnt soil, stones and charcoal. Alongside, south of the canoe, at a lower level, was a row of flat stones resting on the soil and forming the edge of two cists, the smaller of which was uncovered, but the other capped by a slab of hard trap rock, 5ft. 6in. by 2ft. 6in. Beneath this, for a depth of 2 feet, was loose soil with twigs and nuts of hazel; at the bottom, blue clay with broken quartz on the surface. The smaller cist, also filled with loose soil, was divided from the other by a large flat stone set on edge; its more southern wall, however, was built of flat stones in four layers, and this was con-

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* Glasgow Archæological Society, Vol. II., p. 46.

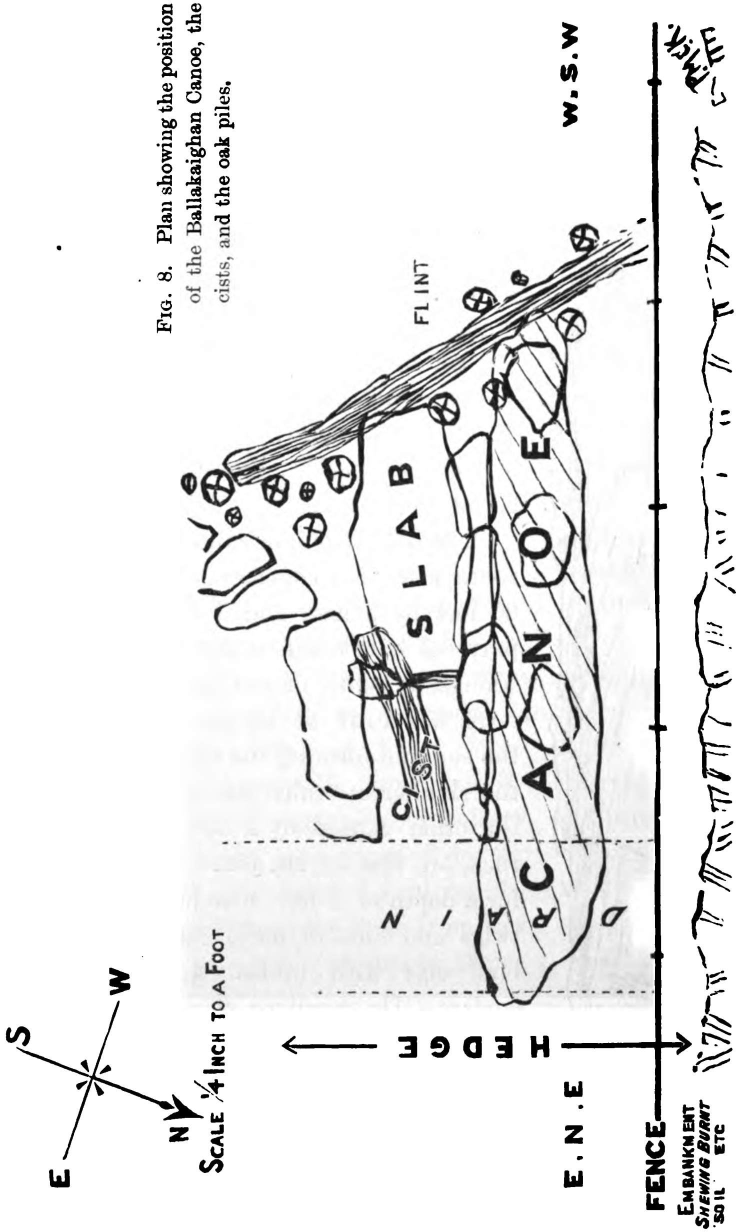

FIG. 8. Plan showing the position of the Ballakaighan Canoe, the cists, and the oak piles.

tinued in a curve westward and southward. Two large pieces of oak lay horizontally about 2ft. 6in. below the surface: one, which crossed close by the W.S.W. end of the canoe, lay diagonally with it about S.E. to N.W., and measured 8½ft. by 10in. diameter at its widest. The other, almost at right angles to this, its S.W. end about 4ft. off, passed diagonally beneath the smaller cist. Thirteen piles of oak were disclosed, the broken tops of which were about level with the bottom of the canoe. The largest measured 3ft. in length, of which about 18in. was formed into a point, very clean and smooth to have been done by an axe of stone; its diameter was 10in.

This was about 50 feet from the edge of the brooghs, and about 200 feet above sea-level. Inland, to the S.W., further traces of burning have been found, and more oak piles, while throughout the field great numbers of flint flakes and cores have been picked up.*

The transition from the Neolithic to the Bronze stage of culture must have been gradual in the Isle of Man. That the earlier people were not exterminated by these first Aryan invaders is evident from the fact that the small Iberian type may still be recognised in the Manks folk of to-day; as also may the taller round-headed type of the Bronze Age man.

Evidences of the transitional stage are to be seen in some sepulchral monuments of intermediate type, such as "King Orry's Grave," Laxey; a cairn at Ballagorry, Dhoon, Maughold; a passage grave at Kew, German; perhaps the circle on the Braid, near Sliean Chiarn, Marown; and one or two more. One of the most curious and interesting of these is the circle of cists on the Meayll Hill, above Port Erin, and as we made a careful examination of this some years ago† and as it is the demand for copies of our paper now long out of print that has caused us to write out the present notes, we shall re-print here with some slight alterations and corrections that former account published in 1[illegible].

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* Yn Lioar Manninagh, I., 36; part 2, 78.

THE EXCAVATION OF THE STONE CIRCLE ON THE MEAYLL HILL.

At the south end of the Isle of Man, next to the Calf Island, is a group of low rounded hills which stand out rather prominently from being nearly completely separated off from the remainder of the land by the narrow neck of low-lying country which runs from Port Erin on the west to Port St. Mary on the east. This is the "Meayll" (pronounced "Mule," derived possibly from the Scandinavian "Muli," a muzzle or snout, or perhaps more likely from the Celtic "Meall," = a hill or rising ground of rounded shape; so "Meaull" in Galloway, and "Moyle" in Ireland), a district very well suited to be a stronghold in savage times as it is surrounded on three sides by lofty and precipitous sea cliffs extending from the formidable Spanish Head and the Chasms round by the Calf Sound to Port Erin, while on the fourth side is the low neck of land which was formerly submerged and after that for a long time was no doubt a swamp or morass. This commanding situation probably rendered it a favourable habitation in early times—possibly it was a last refuge in the Isle of Man of the preceltic race—and on the higher parts of the hills, still uncultivated, we can trace the lines of ancient boundary fences dividing the moorland into small plots, we can find the remains of at least three prehistoric villages or clusters of huts, and near the highest summit, known as the Meayll Hill, is the remarkable stone circle we are about to describe, an ancient burial place probably common to the neighbouring villages (see fig. 9).

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† Trans. Liverpool Biological Society, Vol. VIII., p. 159, Pl. X.-XII. Yn Lioar Manninagh, II., p. 117.

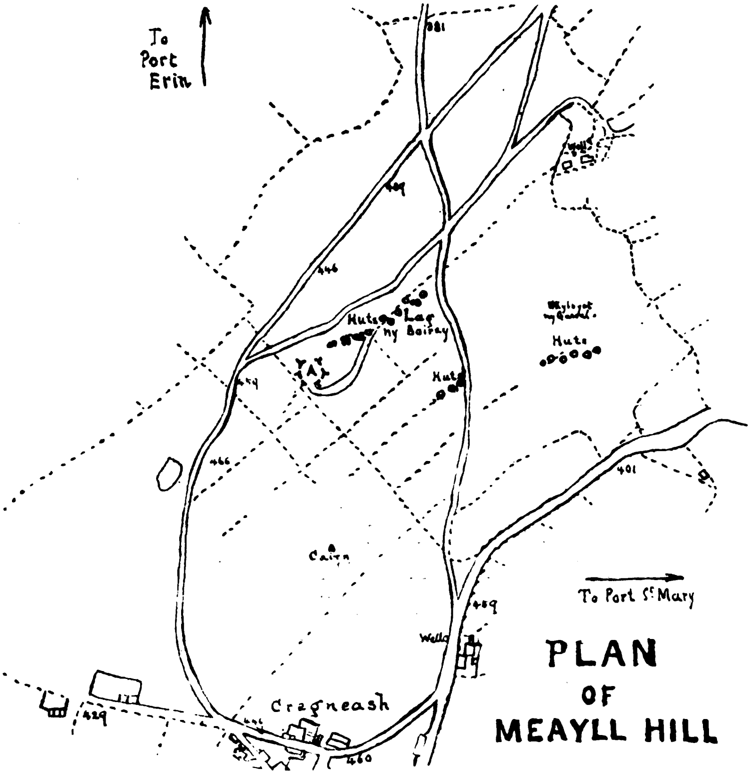

FIG. 9.

In form and arrangement this circle is we believe unique, and although it has long been known to local antiquaries, it has never, we consider, been adequately described or systematically explored. The late Mr. Jeffcott of Castletown gave an account of it to the

Cambrian Association in 1865, and this is quoted, and an imperfect figure given, by Fergusson in his "Rude Stone Monuments" (p. 158).

To this account, which is not quite accurate, he adds that from simple inspection it is evident that these cists must at one time have been covered with earth, and if so, thinks that so far as one example can go they would tend to prove that the circular vallum at Avebury and many other localities was a place for the deposit of bodies. He remarks upon the two gaps or openings in the circle opposite one another, as at Arbor Low and Penrith, but suggests that they may have arisen from the removal of cists. As the result of our examination we can state definitely that that is not the case—the openings were certainly left intentionally.

Finally, the Manks Archæological Commissioners in their report to Sir Henry Loch in 1878 catalogued this circle and recommended that a careful excavation should be made. This recommendation we endeavoured to carry out during August and September 1893, having first duly obtained permission from the proprietor; and although we found that some parts at least had evidently been formerly disturbed by irresponsible persons who have left no record—probably early diggers for treasure without any archæological knowledge or interest—still we unearthed a very perfect series of eighteen cists, and some remains of pottery and implements, and are now enabled to put on record a detailed description of this, one of the most interesting of ancient Manks monuments, and to draw more certain deductions as to its age and purpose.

Our general plan of the Meayll Hill (fig. 9), on the scale of about 6 inches to the mile, shows the position of the stone circle (A), the sites of the hut villages and the lines of the ancient boundaries.

HUT VILLAGES.

Of the little villages referred to we have discovered the sites of three, containing each the foundations of 4 to 16 huts. The largest and most interesting of these groups (fig. 9) still retains amongst the country people its name "Lag-ny-Boirey," hollow of trouble, or lamentations, or strife, or, as the people put it, of "botheration."* When or why this name was given one can now only conjecture, but as it is good Manks, it seems to imply that the place was still known as an inhabited village within historic times.

This village lies about 330 yards N. of the cairn at the summit of the hill, and is immediately at the foot of the ridge on which the stone circle stands, in a sheltered hollow looking towards the north. The hut foundations of earthen banks and large unhewn stones are overgrown with heather and gorse, and lie in a straggling row along the eastern side of one of the ancient boundary fences; they extend over an area of about 130 yards, and are placed at distances apart of from 3 to 24 yards. In at least three instances there are groups of 2 or 3 huts adjoining, so that one wall would serve for two. One of these which we excavated measured inside 8 by 3 yards, and appeared to consist of two dwellings. The foundation stones were still in position and marked out a roughly rectangular building, with a division across the middle, having at the S.W. end what was probably an entrance passage 4 feet long by 3 feet wide, but partly built up like a step at the outer end. At a depth of about 18 inches we came on what was clearly the ancient floor with some charcoal on it and fragments of pottery from $\frac{1}{8}$ to $\frac{3}{8}$ inch thick. The pottery evidently belonged to a crock-like vessel with a lip, and a reconstruction showed the mouth to have been about $4\frac{1}{2}$ inches across.

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* When we laid an account of these excavations before the meeting of the British Association at Nottingham in September, 1893, Dr. Munro, President of Section H, suggested "scolding" as a better rendering of the word.

Another part of this village which we excavated proved to be a group of 4 huts varying in inside diameter from 6 feet to 12 feet 6 inches. The largest, of which the foundation stones all appeared to be in position, was rectangular and had an entrance about 3 feet square at the N.E. end; it was separated from the others by a wall 3 feet thick. A few small flat stones were found on part of the ancient floor, but nothing that was an undoubted hearth. In one of these huts was found a flint scraper, in another a small flint flake with two cutting edges. Perhaps a more remarkable find was a stone $5\frac{1}{2}$ inches by $1\frac{3}{4}$ inches by $\frac{3}{4}$ inch, of which one face was polished, having probably been used as a whetstone for polishing flint implements, or as a rubbing or polishing stone in curing and preparing skins. There were also found some small flints and quartz pebbles which may have been used for striking a light. Possibly the white quartz pebbles, a great number of which were also met with in the cists of the circle, had been used as "pot-boilers." If the rudely baked clay vessels were not able to stand much fire the contents may have been cooked by dropping in these stones previously heated on the hearth. This explanation may account for the small pebbles in the huts, but scarcely for the great numbers found in the graves (see below).

Somewhat further east than this village of "Lag-ny-Boirey" we found the circular foundations of 3 or 4 more huts measuring from 8 to 12 feet in diameter, and like the others these are on the line of one of the ancient fences (see fig. 9). Lower down the hill and still further to the east are half a dozen more such hut foundations. Their outside diameters are from 4 to 5 yards, and the stones forming them—about 12 in a circle—measure about 4 feet by 2 feet and project about 2 feet above the surface; they are unhewn blocks of the same Manx slate of which the fences and the circle and the rock of the hill are composed. Like the other huts these are also on the line of one of the ancient fences and (also like the rest) occupy a sheltered situation looking to the north (*i.e.*, with an uninterrupted view across the lower ground to the remainder of the Isle of Man). This village has the further advantage of being just above the spring which is known as "Chibbyrt-ny-Garval," Horse-well.

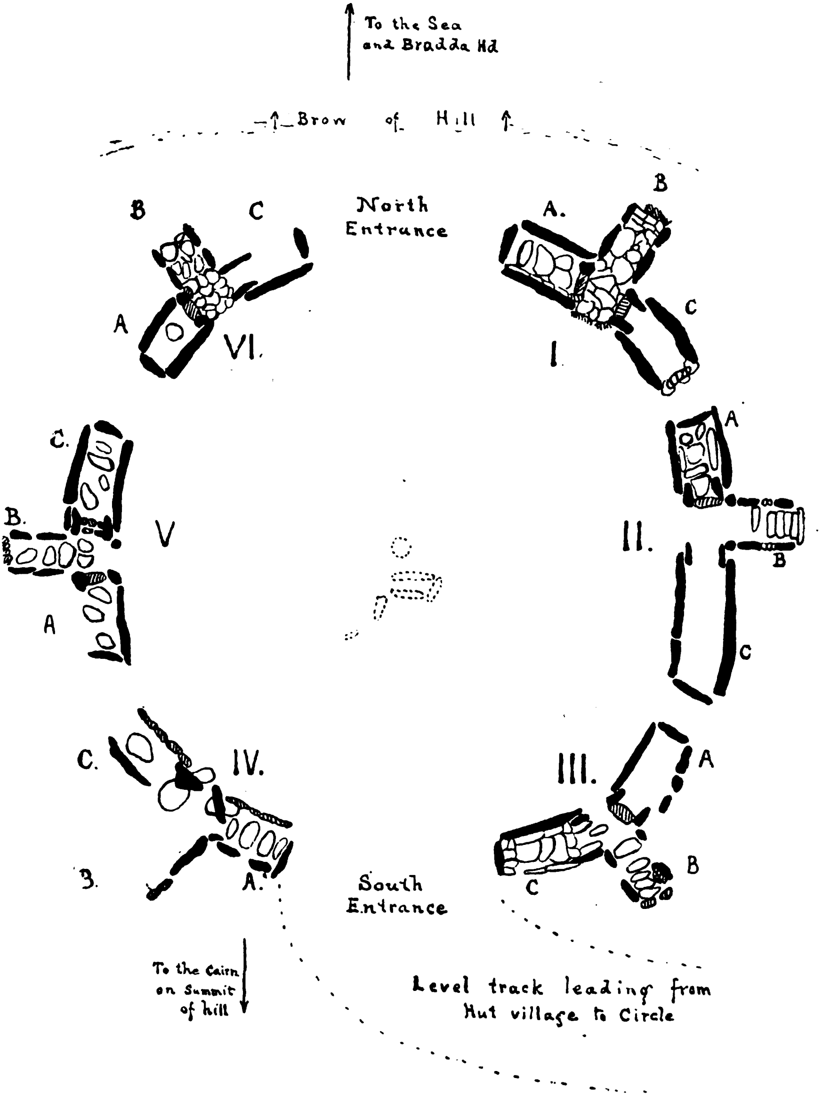
One is tempted to suggest that we may have yet another of these ancient villages existing to this day in Cregneash, on the other slope of the hill, about 250 yards to the south of the cairn, and usually regarded as one of the very few typical old Manks villages left. Possibly some indication of this may yet be found by a careful examination of the gardens and bases of the cottages at Cregneash, but in the meantime it is interesting to note that Sir George Head writing in 1837 in his "Home Tour" (Vol. II, p. 23), speaks of a small hamlet near Spanish Head and between "Port-le-Murray" and "Port Irons" which must be Cregneash as "composed of edifices so rude, that it is really hard to predicate of the houses at a little distance, whether they are masses of rock or human dwellings."

THE STONE CIRCLE.

The most interesting relic on the Meayll Hill is the stone circle which is situated a little way down from the summit at a distance from the cairn of 250 yards in a direction 10° W. of north, and at a height of about 500 feet above the sea. Mr. Jeffcott gives this burial place the name of "Rhuillick-y-lagg-shliggagh," graveyard of broken slates. This name however we have ascertained belongs without doubt to the circle down at the Calf Sound a mile or so to the South, and we had no difficulty in discovering the true name of the Meayll Circle, for it is still in actual use among the fishermen, who take its prominent stones in a line with the Calf as a mark for one of their fishing grounds, and apply to it the name of the ancient village in the hollow immediately below (which of course is not visible from the sea), Lag-ny-Boirey, or hollow of botheration.

The circle (see fig. 10) is formed of six symmetrically arranged sets of cists or stone chambers, each set—for which we propose the term "tritaph"—being composed of one radial cist and two tangentially placed. Three tritaphs form the eastern half of the circle and three form the western, leaving considerable gaps or entrances at north and south. The south entrance measures 16 feet in a line with the external circumference, while the corresponding opening at the north is 18 feet across. The north to south diameter measures 50 feet, and the east to west 57 feet. A circular mound of loose stones and earth packed on to the external circumference of the cists slopes to 3 or 4 yards beyond the above measurements, and the whole may have formed a "disc-shaped Barrow," such as there appear to be traces of elsewhere in the Island.

There is some indication of a cist or chamber of some kind having formerly been in the centre, but it has evidently been previously disturbed and is no longer recognisable. Although there are slight differences in size and proportion between the different tritaphs they are all built on the same plan, viz., two large cists placed end to end running along the circumference of the circle, and one rather longer narrower one directed radially outwards



PLAN OF CIRCLE OF TRITAPHS.

FIG. 10.

from the place of junction of the two former. The arrangement then is a triradiate one; we shall call the end of each cist which is nearest the common centre of the tritaph "proximal," the remoter end "distal." The tangential cists are composed each at the distal end of an outer end stone about 3 feet wide, of two side stones or monoliths placed on edge and measuring up to 8 feet in length, and of an entrance at the proximal end. This entrance consists of a pair of upright pillar stones one at each side, measuring 18 to 24 inches across, and standing within and partly overlapped by the large side stones. Sometimes at the base of the pillar stones and stretching between them is a flat slab, sill or step, and sometimes traces of a low wall built of smaller stones. In no case is this end closed by a single large end stone.

Between the proximal ends of these tangential cists and running out at right angles to them is the third or radial cist of the tritaph. It is formed of two pairs of small side stones each 1 to 2 feet across, and in all cases is open at its distal end where in some cases there are a few steps, formed of rough slabs, leading down from the surface of the ground to the floor. No gateway is present in the radial cists, which thus differ constantly in several points of structure—of sides, and of both ends—from the tangential cists. The average size of the tangential cist is 5ft. 9in. by 2ft. 8in., and of the radial cists 7ft. by 2ft. 3in. The floor, at a depth of 18 to 24 inches below the present surface, showed in all cases indications of a pavement of flat stones, on the average about 1 foot across and 1 to 2 inches thick. All these stones, from the large monoliths to the small gate posts and floor stones, are of the grey clay slate of which the mountain is formed, and some of which crops out close at hand with highly inclined cleavage planes, so that probably large slabs could be readily split off with wedges and then dragged or rolled to their present positions. No lintel, impost, or covering to the cist now remains, these having doubtless been long since removed for building and repairing fences. This removal and the fall of rubbish consequent thereon would in part account for so much broken pottery in the cists. Above the flooring of flat slabs and the buried urns, ashes and flints, the cist appears simply to have been filled in with loose stones and earth up to nearly the top of the side stones (see Fig. 1 on fig. 11). The burials were evidently all by cremation, 2 to 5 or more urns being deposited in each tangential cist or in the proximal end of the radials—we met with no such remains in the distal part of any radial cist.

Altogether we have been able to distinguish the remains of at least 26 distinct urns, all however in a fragmentary condition. With this pottery were some fragments of calcined bones, ashes and loose charcoal, also compacted lumps of bone, ash, and charcoal, with a certain amount of greasy black matter. A few flint instruments were met with, including three arrow heads (Fig. 2 on fig. 11), at least 5 knives, a scraper, and some broken pieces. In each cist also were found a number of rounded white quartz pebbles, from the beach, measuring 1 to 6 inches in diameter. These were found scattered through the grave without obvious arrangement, although they may originally have been carefully deposited on the floor around the urns or in some definite manner. In some other ancient burial places in the island similar white quartz pebbles, evidently brought from the sea-shore, have been used. Can this be the origin of the superstitious dislike the natives still have to the use of the "claghbane" or "white stone"? Fishermen, for instance, will refuse to go to sea in a boat which has a white stone in the ballast.

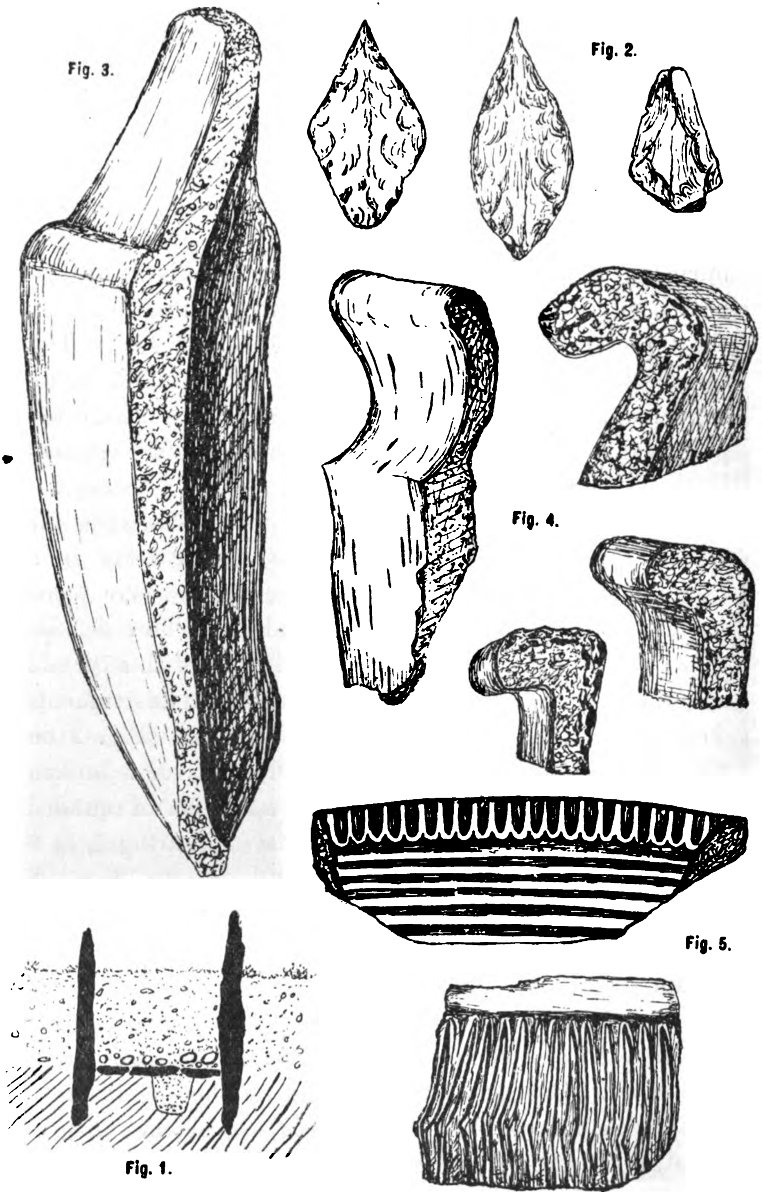


Fig. 3.
Fig. 2.
Fig. 4.
Fig. 5.
Fig. 1.

FLINTS AND POTTERY FROM CISTS.

FIG. 11.

In one cist—VI.A of our plan (fig. 10)—we found immediately beneath the pavement or floor a hole measuring 12 inches in diameter at the mouth and 12 inches in depth, filled with a fine dark soil like that *above* the floor of the cist, while with this exception all the floor stones rested on the undisturbed surface of the hard yellow mountain soil. This suggested that in this case an urn had been buried in the soil under the floor, and in fact nearly all the pieces of pottery and the flints were found beneath the floor stones. How far this position is due to the cists having been disturbed before, the contents turned over, and the urns broken it is impossible to say.

Now we shall note briefly any special characters of the tritaphs, commencing at the north-east corner (see fig. 10). We label the tritaphs I to VI, and the cists in each A, B, and C—B being in each case the radial one.

In I.A we found an old worn shell of *Littorina littorea*, also fragments of pottery which proved on examination to belong to at least 5 different vessels measuring from 9 to 12 inches in height and about the same in widest diameter. Other fragments, some evidently belonging to the same urns, lay in the central space between A and C.

In II.A in its north-west corner were loose pieces of charcoal and some burnt bone fragments, also traces of a black oily substance possibly the result of charred animal matter mixed with earth. We were told that 20 years ago a man named Fargher had dug a perfect urn out of cist C. No description or record of it was however kept, and the urn itself has disappeared. We think that it was in or beside this tritaph that in 1882 Mr. F. Swinnerton picked up a small beautifully finished flint arrow head.

In III.B a small flint scraper was met with, and in C some pieces of pottery belonging to 5 urns and 2 broken knives. The space between this and the next tritaph, an interval of 16 feet, was tried in various places with spade and pick, but was found to be undisturbed mountain soil. It evidently formed the southern and main entrance to the circle (see fig. 12). A level track, like a road way, leads from here in a curve down the slope of the hill to the hut village (see figs. 9 and 10).

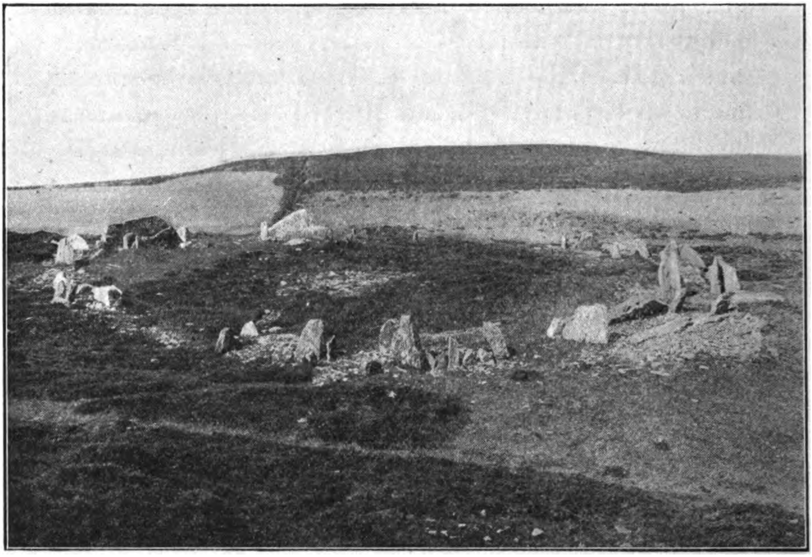


Fig. 12. View of stone circle from the south-east. The southern and northern gaps, and the groups of stones forming tritaphs, are easily seen.—From a photograph.

Tritaph IV., the first on the west side going from S. to N., had evidently been disturbed before, and some of the stones had been displaced and removed, but still on clearing them out the shapes and sizes of the cists were readily distinguishable. The next, V., was pretty perfect. In A some fragments of pottery belonging to 3 urns, calcined bones, 2 flint knives and 2 arrow heads were found, and in the central space between A and C some pottery. In C were some fragments of pottery (at least 2 vessels) at the S.W. and N.E. corners, also a flint knife and another arrow head.

Tritaph VI. was also a perfect one, and cist A particularly so. In it some flints and pottery were met with in the N.W. corner, and in the centre was the hole excavated under the floor which had evidently once contained an urn and which is referred to above (fig. 11). In C some flints and fragments of pottery were found between the entrance pillars. This completes the circle. Between tritaphs VI. and I. is a space of 18 feet which we tried carefully with pick and spade and found nothing but soil and small stones. It had evidently been left intentionally as the northern opening of the circle, facing down the hill towards Port Erin Bay and Bradda Head.

With respect to the pottery, we found in all remains of at least 26 vessels the appearance of which showed that they had been used as cinerary urns, and along with them the remains of ashes, charcoal and calcined bones. With the exception of tritaph IV., which had been more disturbed before our examination than any of the others, and of II., from which, however, a perfect urn had been formerly taken, we found some pottery in every tritaph, but with two exceptions it was always in the tangential cists. The urns numbered from 2 to 5 in a cist, but there may have been more. From the fragmentary remains the vessels seem to have been all between 9 and 12 inches high and the outside diameter at the mouth varies from 8 to 11 inches. They show some diversity of shape, colour, lip, and surface (Figs. 3-5 on fig. 11). About seven vessels show traces of patterns. These are of the simplest kind, consisting of lines impressed diagonally or perpendicularly across the lips (Fig. 5 on fig. 11) and of lines diagonal, horizontal and perpendicular either drawn with a pointed stick or formed by punctured holes on the walls. There is no colouring save that given by firing and stains. The paste appears in all to contain a mixture of the local slate and quartz, with a good deal of mica, probably from disintegrated granite which would be found in the boulder clay in the neighbourhood. With respect to shape the most notable thing about the vessels is that several of them appear to have had broad overlapping rims or lips (Fig. 4 on fig. 11), not a common type in the Isle of Man, and some also median bands and grooves. On the floor of one of the huts we found remains of a couple of small earthen vessels similar in colour, material and style to those met with in the cists.

It may be added, since the work in 1893, we have found further examples of flints and pottery in a couple of other huts excavated in 1896 with a view to the visit of the British Association that autumn. These pieces included some mediæval glazed pottery and fragments of a clay figure. including the greater part of a small mask of the human face. These were at a higher level than the ancient floor, and may be taken as an indication that some of the huts were occupied on into historic times.

The flints obtained have already been enumerated. The arrow heads were all of the same type, leaf shaped, showing secondary working and careful finish (Fig. 2 on fig. 11). Two are worked on both faces, the third, which has lost its point, is worked only on one face. The knives are all of the same type, the flat face left intact, the convex trimmed by secondary working on one edge only. The largest measures $2\frac{11}{16}$ long by $1\frac{1}{16}$ broad and $\frac{3}{8}$ thick.

The scrapers are small. and rudely made. One of yellow flint measuring $1\frac{1}{8}$ inch by 1 inch and $\frac{5}{16}$ thick has the bulb of percussion at the broad end, the edges which are sharp and narrow are rounded to a point, and only the edges show secondary working. A scraper of about the same size from one of the huts shows almost no trace of secondary working. An awl, or perhaps a knife, from the huts resembles one figured in Evans' "Ancient Stone Implements," figs. 235 and 239, but is smaller and broader in proportion. The point and the butt are rounded and both edges sharpened, but it shows very little trace of secondary working.

A much larger flint implement than any of those we found in the stone circle or the hut village, and which might be called an adze (fig. 13), was picked up a few years ago by Mr. Nixon on the Meayll Hill near Cregneash.

In conclusion, these remains seem to show that the people who inhabited the ancient villages on the Meayll and who erected and used the stone circle, were in the last days of the Neolithic or the beginning of the Bronze Age, living in small communities of 4 to 16 families, that they occupied the locality over a lengthened period, and were there when the later Celtic population settled in Man. They used pottery of a rude kind, made by hand, of materials obtained from the spot, for domestic purposes and as urns in which they deposited the ashes of their dead. The stone circle on the hill above the villages was used by them as a place of sepulture, and the only mode of burial there was by means of cremation. They hunted and fought with flint-tipped arrows, used flint scrapers to clean and prepare the skins of animals for their clothing, and the flint knives no doubt for various other purposes. In regard to the ceremonies of burning their dead and the burying of the ashes we can only conjecture, but the size and nature of the cists, the presence of the numerous quartz pebbles, the buried weapons and implements deposited with the ashes, all would seem to indicate the funeral rites of a people imbued with some religious ideas however primitive.

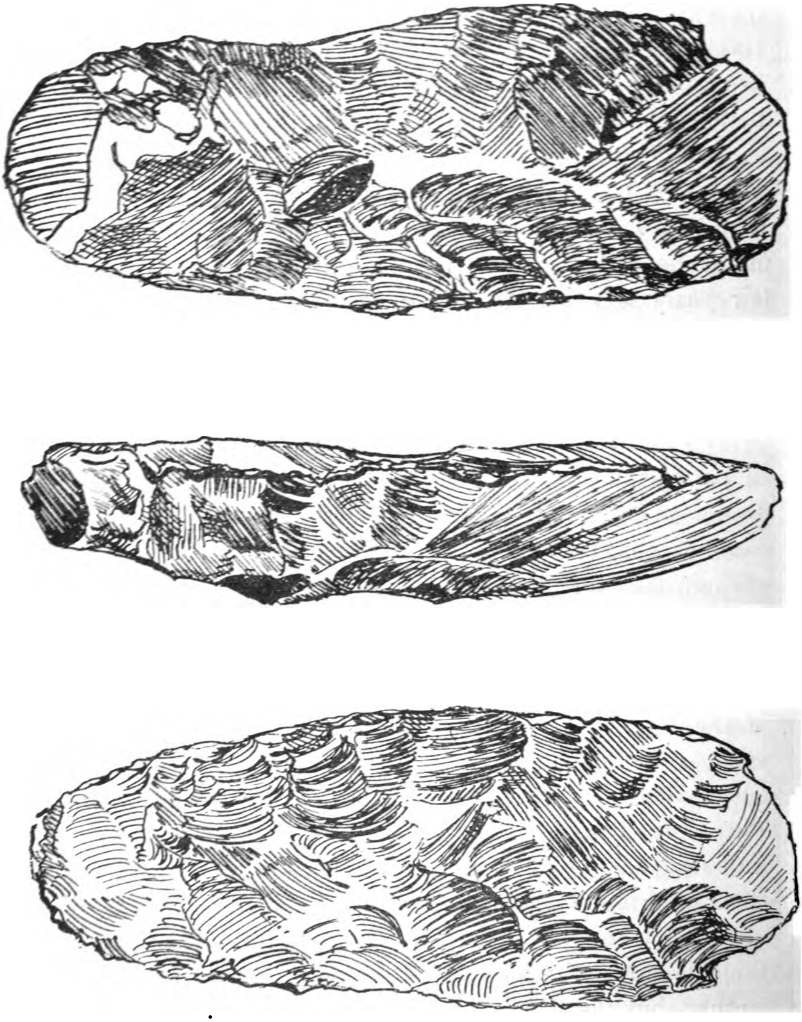


FIG. 18. Three views of adze, from the Meayll Hill.—From a sketch by B. S. Herdman.

We have done our best to make the examination of the huts and stone circle of the Meayll Hill as thorough as possible, and what is perhaps of nearly equal importance we have lost no time in placing the results on record for future reference. We trust the proprietor may now be induced to make over the guardianship of this unique relic to the Trustees of the Manks Museum, in order that it may be thus preserved as a National Monument of interest not only to Manksmen but also to Archæologists in general. This was written in 1893, but no steps have yet been taken to protect the Meayll antiquities.

Returning now to other parts of the Island, we may mention here, as of still undetermined age: (1) A large circle of small and comparatively inconspicuous stones high up on the lonely shoulder of Bradda Mountain which overlooks Fleshwick, and (2) a very neat little circle, known as Cronk-Carran, formed of regular, for the most part, upright stones, and only a few yards in diameter, which is placed on a grassy patch part way down the cliff near the Chasms at Spanish Head. These have not been excavated, but will probably prove to be of late Neolithic or early Bronze Age.

The group of monuments commonly known as "King Orry's Grave" (fig. 14), in Laxey, appears to have consisted of a large cairn of stones, 30 feet in diameter, out of which arises a tall thin conical slab about 10 feet high (figs. 14 and 15); from this extends eastward a line of cists, formed of two rows of flat boulders, set edgeways, four feet apart. About 40 yards eastward across the high road are the remains of another large tumulus (fig. 16). Mr. Barnwell, Secretary to the Cambrian Archæological Association, which visited the Island in 1865, says human bones, the skeleton of a horse, an iron sword and horseshoe were found in opening this cairn, 30 years previously, but Dr. Oswald, a local antiquary who was in a position to know, mentions only a "tooth and remains of a horse."

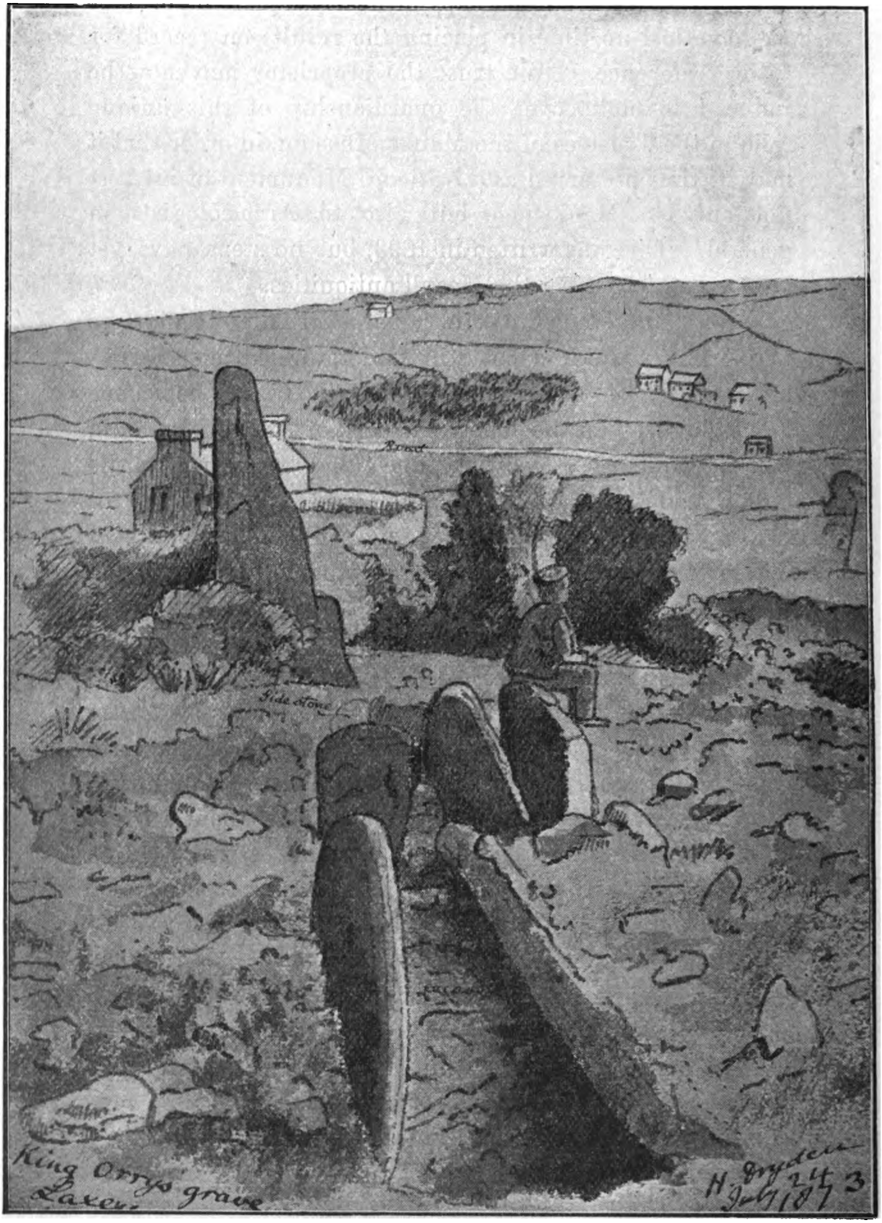


FIG. 14. "King Orry's Grave." From a sketch by Sir Henry Dryden.

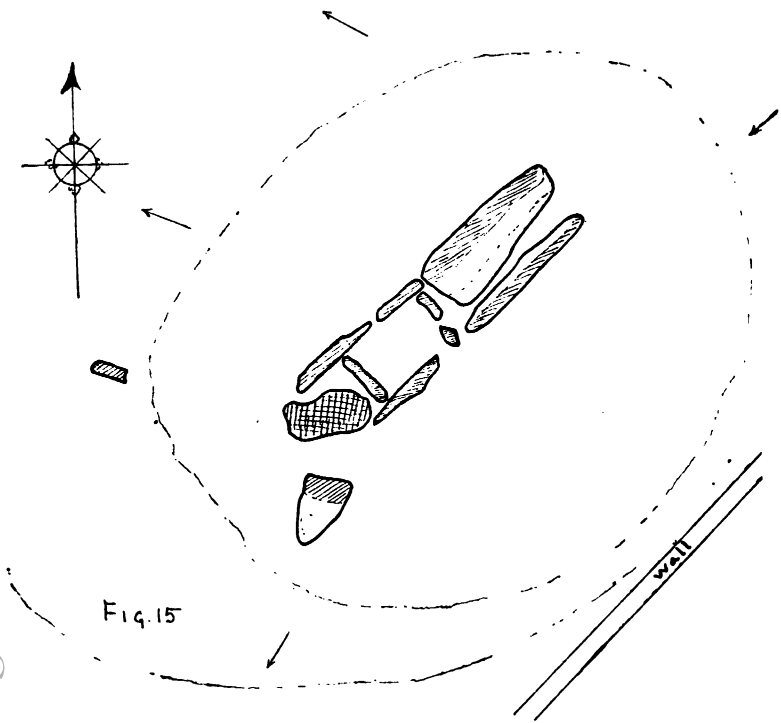


FIG. 15. "King Orry's Grave," plan of the western cist.

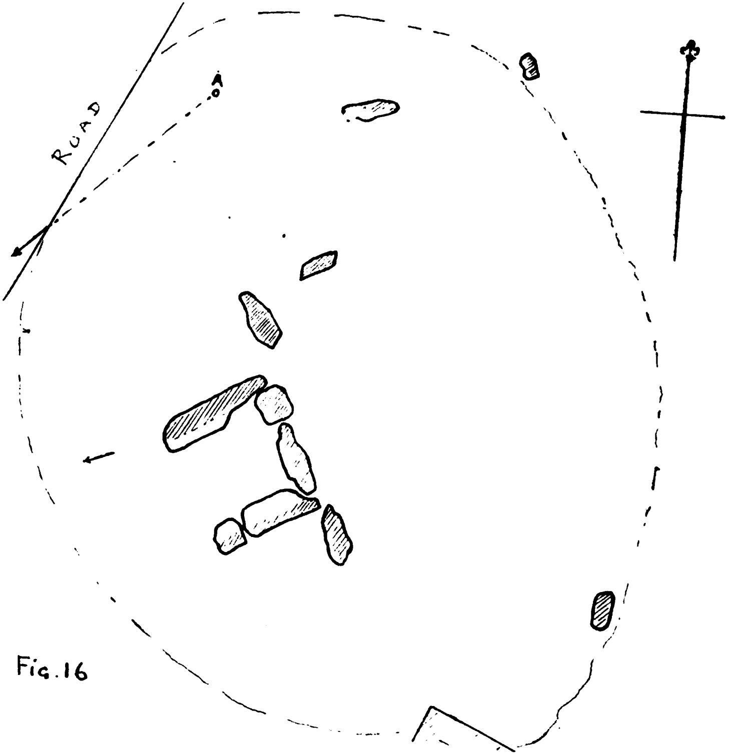


FIG. 16. "King Orry's Grave," plan of the eastern cist.

The Ballagorry Cairn (fig. 17), Maughold, consisted of a circle of massive stones, 10 yards in diameter, on the north-east side of which was an oblong platform about 4 feet high. On its south-east side was a line about 38 feet long of three or more cists, in which were found remains of a skull and other human bones, and a good deal of broken pottery; at either side was a line of larger stones set on end. The largest piece of pottery must have been part of an urn (food-vessel), about 7 inches diameter at the mouth. About 1825, when a sketch was taken by Dr. Oswald for the "Vestigia antiquiora" (Manks Soc., Vol. V., p. 66), the monument was surrounded by a rough walling of large stones. The covering consisted chiefly of quarried stones laid flat over each other, about 4 feet high, and an incomplete circle stood at the western end. The length from east to west of the remains is 105 feet, breadth at west end 50 feet, at east end 40 feet. The western part, including the circle, is 70 feet long, the east portion 35 feet, and lower than the other. There are also traces of a cross wall (a). The arc of the semi-circle is 70 feet, and the distance between the outer stones 32 feet. Oswald, 1860, had seen the platforms, the stones of which were used in building a new house. The circle remained untouched, its diameter being 10 yards—the circumference of the whole ruin is 90 yards. The largest stones are 10 feet high, and between the two central ones is an opening into the first cist 20 inches wide. In this cist, 10 feet long and 5ft. 6in. wide, with side stones leaning towards each other at the top, we found black carbonaceous and grey unctuous earth, with fragments of charcoal. Under the side stones were pieces of human bone—portions of a skull with the suture open, upper jaw bone, with teeth regular and sound, evidently of a young person, and other fragments; also pieces of at least two urns.

The eastern cist also contained bones and fragments of a smaller urn. The other chamber contained similar black carbonaceous and grey unctuous clay with charcoal and a few pieces of flint.* In form this remarkable monument shows some resemblance to the Neolithic long Barrows found elsewhere in the British Islands.

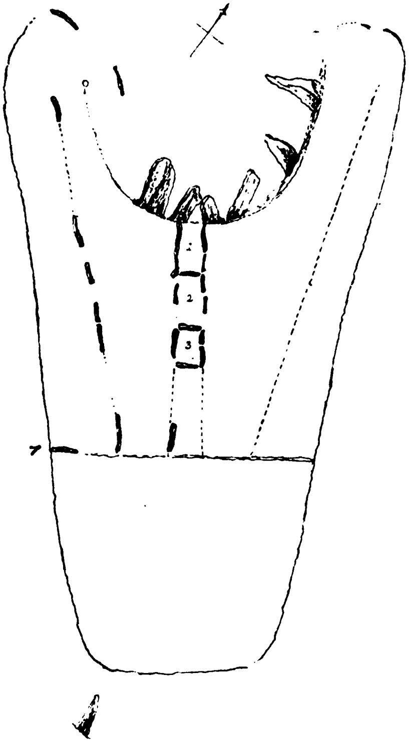


FIG. 17. Ballagorry Cairn, Maughold. Sketch by Rev. S. N. Harrison.

The remains marked on the Ordnance maps at Kew, German, consist of an avenue of upright stones leading to a tumulus which has not been opened.

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* Reliquary, Vol. XXV., Pl. XIX., 1884. Trans. Soc. Antiq., Scot., Vol. II., Part 2.

The monument on the Braid, Marown,* is a large circular mound of earth and rubble about 3 feet high, with slabs on end set around (fig. 18). The diameter, inside, is about 12 yards. An entrance on the south is distinguished by two upright stones facing each other, about a yard apart. Alongside on the N.E., and apparently associated with it, is a remarkable avenue about 36 yards long by 10 yards wide, formed by two substantial embankments of earth and large stones. Between this and the circle are two rings of stones on end, evidently remains of a tumulus from which the soil has been removed.

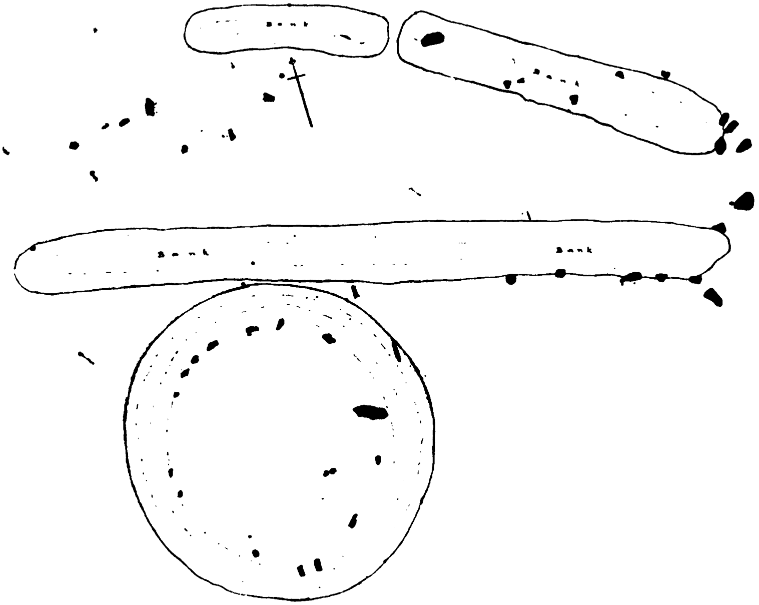

FIG. 18. "Mount Murray" Circle: Plan of the remains on the Braid, Marown, after Sir H. Dryden.

The remains of a circle which may have been of similar character are to be seen at Glen Aldyn, Lezayre, near Ramsey. There is a ring tumulus consisting of a circle of white quartz boulders about 40 feet in diameter. On the south a portion of the rubble mound remains, exposing a cist (see fig. 19) 3ft. by 1ft. 6in., and 2ft. high (inside measurements). There were other similar cists, containing urns and ashes, which were exposed when the greater part of the surrounding circular mound was removed in making the mountain road about 300 yards above. It is probable that the circular mound on the Braid, if excavated, would show similar chambers.

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* Sometimes called Mount Murray Circle.

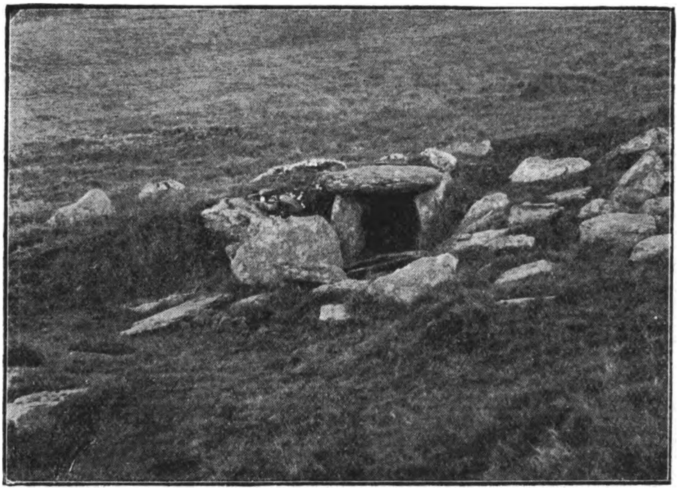

FIG. 19. Stone Cist at Glen Aldyn. (Photograph by M. McWhannell.)

The Bronze period in the Isle of Man was not merely a stage in civilisation. There is no reason to doubt that the Neolithic people here were the same Iberian, pre-Aryan folk who occupied the rest of the British Islands for a lengthy period previous to the arrival of the Celts. Similarly we may quote Professor Boyd Dawkins' words in regard to the coming of the Bronze Age people as applying to the Isle of Man:—

"The tall, round or broad-headed Celts . . . composing the van of the great Aryan army, ultimately destined to rule the West, brought with them the knowledge of bronze into Britain, and are proved to have conquered nearly every part of the British Isles, by their tombs scattered over the face of the country, alike in England, Scotland, Wales and Ireland. The conquered peoples survived probably in a state of slavery, and were only preserved from absorption in the West, where further retreat was forbidden by the waters of the ocean."*

It is natural to suppose that these invaders on first establishing themselves spread over England and some parts of Wales and Scotland before they came to the Isle of Man, and, when they did arrive in the island, they were probably in the later division of the Bronze Age, that period of which bronze swords, palstaves, and socketed celts such as have been met with here are characteristic implements.

The dwellings appear to have been similar to those of the Neolithic folk—possibly larger and better built. It may well be therefore that some of the groups of huts to which we have referred as originating in Neolithic, continued in use in Bronze times. As we have stated there is some evidence that those on the Meayll Hill were occupied even far later.

We have records also of crannoges, or pile-dwellings, artificial islands formed of stones, tree-trunks, and smaller stuff piled up, in a lake or morass, and kept in position by stakes so as to make a platform upon which huts could be built in a secure position, surrounded by water. Elsewhere these lake-dwellings are mostly of Neolithic or Bronze

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* Early Man in Britain, p. 343.

Age, though some have remained in use into historic times. Until the Manks examples have been more carefully examined it is impossible to say to which precise period they belong.

Comparatively few loose articles of bronze have been recorded, and of these most have been lost. So far as is known, those found consist of celts plain and socketed, palstaves. swords. dagger and spear heads, and sickles (see fig. 20, showing a group of characteristic forms).

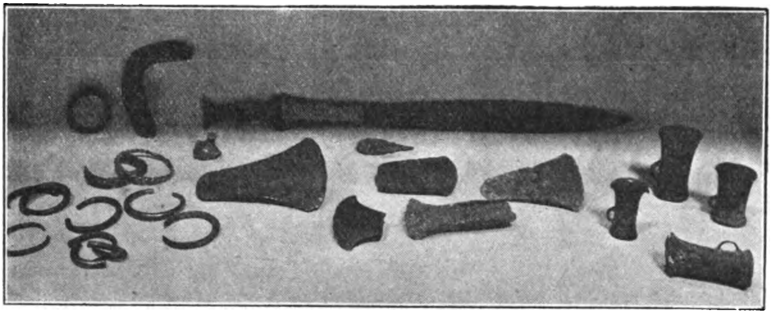

FIG. 20. Bronze weapons from the Isle of Man.

Many of the polished stone implements, all of which appear to be of foreign material, must have been introduced during this period (see fig. 21, which shows some of those now collected at Castle Rushen).

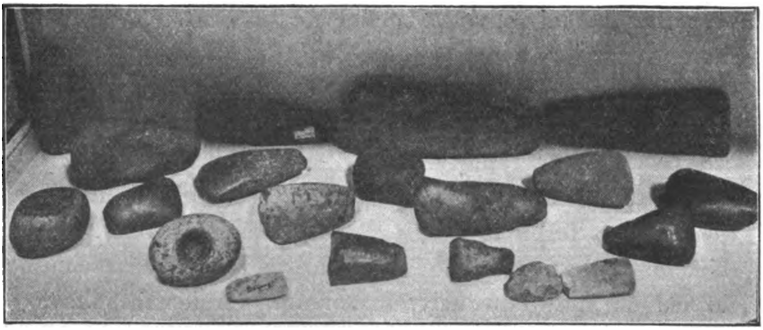

FIG. 21. Manks polished stone implements of Bronze Age.

Though but few bronze articles have been met with, a considerable amount of pottery belonging to this period has come to light, generally, however, in fragmentary condition. This consists of cinerary urns and food vessels, turned on a wheel, frequently ornamented and generally of superior manufacture to that of Neolithic times. Types of the various patterns found are shown in fig. 22.

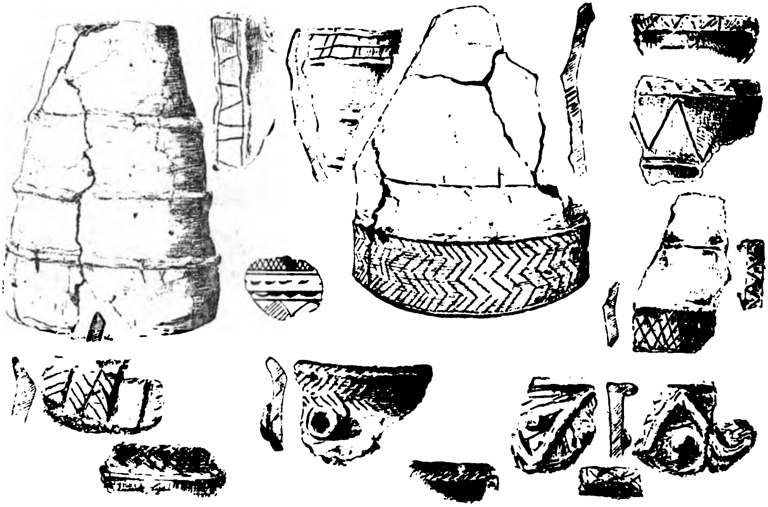

FIG. 22. Bronze Age pottery, from the Isle of Man. Reduced from sketches by P.M.C.K.

Several smaller urns, much more highly decorated, have been found and probably belong to this time. The one shown in fig. 23 with a five-angled star inscribed on the base was found at Cronk Aust, near Ramsey, and contained burnt bones and earth. Another somewhat similar in type was found, empty, in a stone cist near Laxey.

With the Bronze civilisation, the practice of inhumation in cists formed of heavy slabs of stone gave way to that of cremation, although both were for some time carried on simultaneously. Our few implements have been generally found scattered on or near the surface, seldom in association with other remains, but our knowledge of the pottery is derived solely from the burial

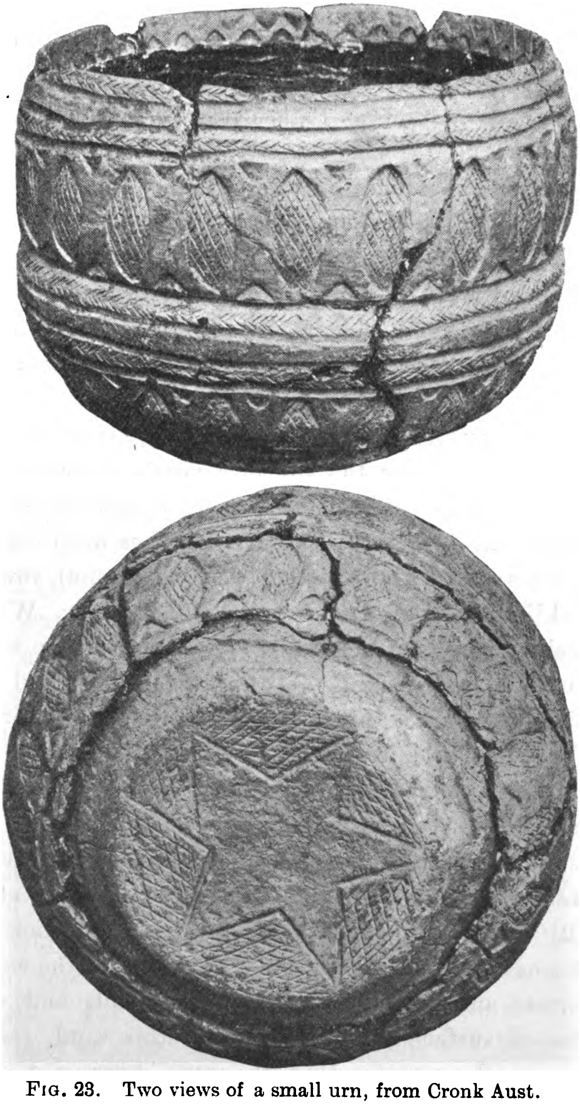

FIG. 23. Two views of a small urn, from Cronk Aust.

mounds of this period, such as those above referred to, which appear to have continued in use for a long time, as well as others of later date. The small round tumuli or cronks, still so numerous, for the most part appear from their contents to belong to this age.

We shall now describe one or two typical examples of these. A mound at Ballaseyr, Andreas, examined about 25 years ago, when it was being cut through in order to form a new fence, was found to measure 4 to 5 feet high by about 24 feet diameter at the base; it was composed entirely of heavy red sand. Near the centre, placed mouth downwards on the original surface, was an urn (one of those shown on fig. 22) half full of calcined bones, measuring 16½ inches high by 15½ inches in diameter across the mouth. The material is a stiff clay with the usual mixture of crushed stones, in this case slate, quartz, granite and trap, from the size of a mustard seed to that of a French bean. The surface is smooth, the colour reddish brown. A border pattern 4 inches deep consists of two lines round the urn, between which four rows of diagonal lines form a sort of herring-bone pattern. Within the bevelled lip is ornamented by two lines, between which are short diagonal strokes. All the lines are formed as if by a bluntly-pointed stick, or possibly by pressing a twisted cord on the plastic clay (see fig. 22).

Another mound at the White House, Michael, examined in 1888, when it was removed for building purposes, stood about 7 feet high, and when perfect the diameter was about 40 feet. It consisted of a bed of red sand, 2½ feet at its greatest thickness, upon which was heaped a cairn of broken quartz, 2½ feet deep at the centre. Above was another 12 inches of red sand, and some 6 inches of surface soil. It was in this sand, resting directly on the quartz, that the urns were met with, together with some charcoal and flint flakes. Six urns, all broken by down-growing roots of gorse, bramble, and grass, measuring from 8 to 12 inches high, were found, one of which was ornamented by lines of short strokes without definite design; one also had a sort of chevron pattern inside the lip. These contained incinerated bones and earth. The largest was 28 inches in diameter. Another, 9½ inches high, was 9 inches in diameter. When subsequently the rest of the mound was removed, no more pottery was met with, nor was there any trace of a cist.

Another mound at Cronk Aust, Lezayre, now levelled,* measured 30 feet diameter and 6 feet high, and was composed of soft red sand and gravel. Near the centre was a small urn (fig. 23), filled with calcined bones, and placed mouth *upwards*, just above the original level of the soil, upon a thin band of dark burnt earth and charcoal. It measured 4½in. high by 6½in. greatest diameter, and was of unusual shape, decorated with simple but effective design.

In this mound, about six feet from the last urn, was a larger one, 12in. high, with diameter across the mouth 9½in., and across the bottom 3¼in. This also was filled with calcined bones, and set, mouth downwards, about 4 feet below the surface of the mound. A flint, possibly a rude arrow-head, 1¼in. by ¾in. was found with some ashes about eight yards away, and about 6 feet below what appeared to have been the original surface.

Many of the mounds in the North and West of the Island have been found to contain from one to twelve, and even fourteen urns, measuring from 12 to 14 inches high (some were much larger), and sometimes highly ornamented. They are generally placed mouth downwards, sometimes on a flat stone, and are filled with burnt bones.

* Yn Lioar Manninagh, Vol. I., p. 89. Manx Book, Vol. III., p. 91.

Unfortunately, only a few broken fragments have in most cases been preserved (fig. 22).

Very rarely have bronze articles been met with in these burial mounds. Only two instances of bone implements are recorded. Of the very few silver ornaments found in the Island some may possibly belong to this period, but in the absence of any direct evidence it would not be safe to speak with certainty.

It is, in the present stage of our knowledge, difficult to say whether there was a distinct Age of Iron in the Isle of Man, and, if there were, when it merged into the Historic Period. A few of the pre-Christian burials, however, would seem to belong to this division, of which they constitute the most satisfactory evidence. Although cremation was still carried on in the Iron Age in Britain, a change began in the burials, and the dead were frequently interred laid at full length in a stone chamber, or shallow pit, along with articles used in the daily life.

A tumulus at Lhergy-rhenny, on the S.W. shoulder of Snaefell, levelled in order to obtain material for fencing in 1883, may have belonged to this period. The mound was between four and five feet high, and over 16ft. diameter. On its N.W. side was a small cist of flat stones set on edge, with some minute fragments of pottery on a layer of ashes. Near the centre was a chamber built of stones carefully laid flat, with sods between them, covered by a capstone a few inches below the top of the mound. The chamber measured 5 feet long by 2½ feet wide, and 2½ feet deep, but nothing was found in it. Just below, and at a different angle, was a similar wall of another chamber on a layer of wood ashes, resting on flat stones, which appeared to have been laid on the original surface. Here and there in the mound were pockets of broken red quartz and small fragments of baked pottery.

The Rev. S. N. Harrison, in 1884, opened a mound on the Barony, Maughold, in the centre of which was a long grave, E. and W., lined on the sides with flags, and having a flag-stone at the W. end, but the E. built up. To the north was a second stone-lined grave; above were traces of ashes.

In a field at Bishopscourt a mound previously reduced almost to the level of the field was examined in 1888 and found to contain a cist about 5 feet long, formed by two side-stones set on edge; in it were remains of burial by inhumation, the body having been laid on its side, head northwards, the knees apparently doubled up. A large slab, 8ft. 6in. long by 16in. wide, might originally have been set upright at the head of the grave. Some charcoal was met with outside the S.E. corner of the cist. Another close by had a capstone 3ft. 8in. long by 2ft. 8in. It was filled with loose sand, but fragments of a skull were met with; also a small urn (full of sand) the shape of a flower-pot, 3¾in. high by 4½in. diameter at the mouth, and 1⅞in. at the bottom. Both cists contained broken red quartz, and rounded white pebbles.

Some of the mounds still existing may belong to a much later date, that, namely, of the Scandinavian settlers, who arrived as pagans about the end of the 9th century, and became Christian in the 11th. Though this Scandinavian nature of some of the burial mounds is certainly likely, we are not aware of any evidence as yet recorded on which to determine the question.

Tynwald Hill itself may possibly have been in its origin a burial mound of peculiar sanctity, afterwards converted into a place of assembly. Whether this was so before the Scandinavian occupation there is no evidence to show, but the name at all events dates from that period. It resembles the "Moot-places," of which remains are still found in Iceland and Norway, and a few in England and Scotland. In these there was always a plain (*voll*); a hillock or mound; a court due east of the hill, and a temple. Tynwald Hill in its present form is an artificial mound, consisting of four circular platforms, the first having a circumference at the bottom of 256 feet, and at the top of 240 feet; the second platform has a circumference at the bottom of 162 feet; the third of 102 feet, and the fourth of 60 feet. It is situated at St. John's, 2½ miles from Peel, and is the scene of the formal assemblies held at least once a year on July 5th (Midsummer Day, old style), when the new laws are read to the people in the open air.

Cronk-Howe-Mooar, "the Fairy Hill," is a very striking, regularly shaped mound, lying on the low ground behind Port Erin, and between Port St. Mary and Fleshwick. If wholly artificial, it is one of the largest and most remarkable works of prehistoric date in the Island, and forms a truly magnificent tumulus. It is probably, however, in great part a mass of gravel and sand, left by floods after the recession of the ice-sheet of the glacial period, and very likely artificially shaped, and possibly fortified at the top in prehistoric times.

The name of this mound is an example of the pleonastic or needless repetition of the same term in the successive languages used in a district by the invaders, each ignorant of the meanings of names they found—Cronk-Howe-Mooar-Hill signifying simply the great Hill-Hill-Hill in the three languages, Gaelic, Scandinavian, and English. And probably each successive race has associated the mound—as it, like many Neolithic structures, is still associated—with the supernatural, or, at least, with fairy lore. Such veneration and superstition lingers on to our own day, for we are told that in 1859 "a farmer in the Isle of Man offered a heifer up as a propitiatory sacrifice, so that no harm might befall him from the opening of a tumulus upon his land."

The Historic Period is represented by structural and monumental remains, dating from the introduction of Christianity to the earlier Celtic inhabitants in the sixth or end of the fifth century. Among these remains are a number of inscribed stones and incised and carved Cross-slabs (see figs. 24 to 42); and the ruins and foundations of early Keeils, Cells, or Churches.

Dr. Oliver, in the Manks Society, Vol. XV. (1868), describing the ancient churches in Man, states that "In their materials and construction they correspond with the account given in the *Book of Armagh* of similar places of worship in Ireland of the age of St. Patrick. When the Apostle visited Tirawley (he quotes) he built there a quadrangular Church of moist earth, because there was no wood near." Here, he adds, "we have an exact description of the Manx cabbal. . . . The cabbal and keeil are invariably quadrangular, the lights oblong or quadrilateral openings, splaying inwards, and the stonework of the doors and windows unchiselled." Since his time many buildings and ruins have been utterly demolished, and we are unaware of any instance answering to his description of "the Cabbal of the Fifth Century," of which he gives a figure, but does not say what it is taken from. He then goes on to describe the keeils, which he supposes to have been "introduced about the middle of the sixth," of which he gives St. Lingan's, Marown, as an instance; the "Treen" Churches, "introduced towards the close of the eighth," instancing Ballakilley, Malew; and "Mortuary Chapels," such as St. Luke's, on the western slope of Cronk-ny-Irree-Laa, Rushen. We are unable to follow his classification, or to agree (from what little can be learned from still existing remains) with his descriptions in every particular.

The following are the most interesting of which traces still remain:—

Keeil Woirrey, in Corna Valley, Maughold, measures (inside) 12 feet by 9 feet, the walls over 3 feet thick and 4 feet high, but 2 feet high outside. The floor shows signs of pavement. The doorway is at the S.W. corner. The surrounding burial ground measures about 93 feet by 60 feet. Among the stones of the ruined wall was one bearing a very simple form of cross, which judging from its appearance may be earlier than the seventh century (see fig. 24, left side). Near this keeil, an interesting discovery was made some years ago by the Rev. S. N. Harrison, who came across a rough unhewn slate slab, used at a well beside the little stream below, which bears an inscription (see fig. 41) in the ordinary Manks runes—

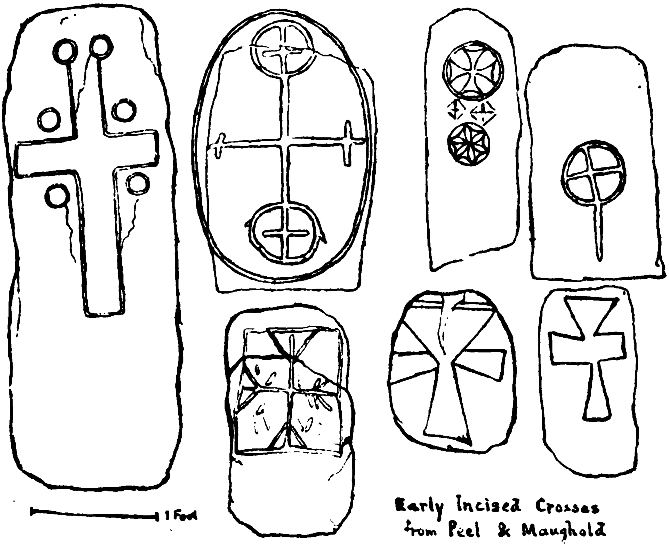

FIG. 24.

with a formula differing from any previously met with, namely—

Krist, Malaki, and Patrick (and) *Adamnan.*
Unal (O'Neal's) *shepherd Juan carved this in*
Kurna dale.

Probably it was cut in the 13th century by Juan of the sheep, while watching his master's flock in the valley, and he was thus distinguished from another, namely, "Juan the Priest," who about the same time carved runes on a somewhat similar rough slab at the parish church.

On Ballafayle, in the same parish, overlooking the sea at the south end of Port Mooar, are the remains of Keeil Casherick, or Keeil Chiggyrt, as it is also called. In the surrounding burial ground was found a wheel-headed cross-slab, now to be seen at the parish church. Sculptured on one face is an equal-limbed cross with knot-work decoration, below which is a human figure probably intended for Christ.

On Ballingan, Marown, are the ruins of a keeil and burial ground. The enclosure is 108 feet long by 63 feet broad. In the south-east part lies the keeil, its walls about four feet high by three thick. In the west end has been a window; the doorway is in the south-east angle, built of rubble stone work with two monolithic jambs inclining. The font measures 1 foot 11 inches long by 10½ inches broad.

Sir Henry Dryden has left (1873) an unpublished plan of another keeil on the adjoining estate of Ballaquinney in the same parish, which we reproduce as a typical instance (fig. 25). It measured 15 feet 4 inches by 10 feet inside. The door is in the west wall, 1 foot 9 inches wide, and the walls are about 5 feet thick.

Dr. Oliver gives an account* (1868) of a Treen Church at Ballakilley, Malew, with a gable which we here reproduce (fig. 26). It is about 50 yards from the farmhouse, and measures 21 feet by 9 feet. "The western gable crowned with ivy is still standing, but the east end is in ruins.' It is built of rounded boulders of granite and quartz, giving it a very peculiar appearance. The walls are "6 feet 3 inches from the ground to the spring of the roof; and the western gable 16 feet 9 inches to the peak. In the south wall near the eastern angle is the door of entrance, 5 feet 2 inches in height, by 2 feet 6 inches at base, diminishing upwards to 2 feet. Opposite, in the north side, is a square-headed window, and another in the south wall near the west end. This window externally is 2 feet 6 inches high by 1 foot 6 inches broad, splaying inwards; internally 2 feet 6 inches by 3 feet. In the north-west angle of the gable is a similar window, 1 foot 5 inches by 9 inches, splaying internally to 20 inches in breadth and 17 inches in length (see fig. 26).

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* Manks Society, Vol. XV., p. 88.

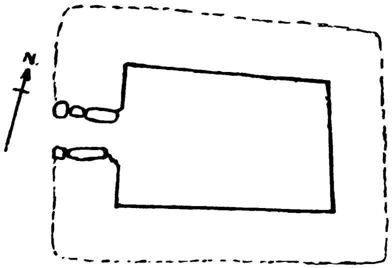

FIG. 25. Plan of keeil at Ballaquinney, in Marown, after Sir H. Dryden.

One of the most interesting of these early keeils is that known as St. Luke's (St. Luac), on the lonely shore at the western foot of Cronk-ny-Irree-Laa. Oliver (*Id.* p. 89), upon what authority we do not know, says "It is traditionally known as the Church and Cemetery of the Danish Kings." It is a stone erection, built without cement, "but the masonry is more regular and much better constructed" than in the case of these other keeils. The floor was paved with pebbly stones. It measures, outside, about

18ft. by 15ft., the walls being about 2ft. 6in. thick, their inside height 4ft. from the floor, outside 3ft.

Burial, in the ancient cemeteries round these keeils, was in "lintel-graves," about 3ft. deep and 2ft. wide, dug east and west, and lined with small flagstones to the height of 15 inches. The corpse was wrapt in a mort-cloth, and the top closed in by similar, sometimes rather larger flags. No implements or relics have been found in any of these graves. Sometimes, says Oliver, two and even three bodies rest in the same grave. "When this is the case they will be found to lie on their sides, with the lower extremities semi-flexed. In consequence of this the grave is smaller, having the appearance of a child's burial. Three or four such graves may be seen in section at Kilkellane, Lonan, where the electric tram road has cut through a burial ground. Sometimes such early cemeteries are found where now there is no trace or tradition remaining of the keeil which must once have stood there, as at the Flagstaff above Glen Wyllin, Michael, and by the old Castletown road from Foxdale, on Barrule Farm. Occasionally these lintel-graves are met with even in the Parish Churchyards, having continued in use until the commencement of the seventeenth century.

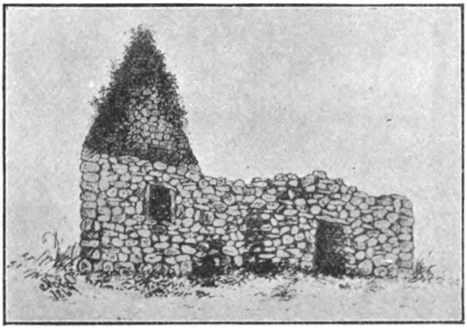

FIG. 26. Treen at Ballakilley.

It is in connection with these old keeils and the later Parish Churches, some of which are on the ancient sites, that those carved stone monuments have been found in which the Isle of Man is so peculiarly rich. With but few exceptions these are sepulchral, and take the form of upright slabs of local stone, ranging from about 2ft. 6in. to six and, in a few cases, seven or eight feet high, by about 15in. to 24in. wide, and from two to four inches thick. They are generally "rectangular, sometimes having the upper corners rounded off, and sometimes the whole head in what has been called a wheel-cross. Occasionally the spaces between the limbs and the surrounding circle are pierced, and, in a very few instances, the slab is itself cruciform."*

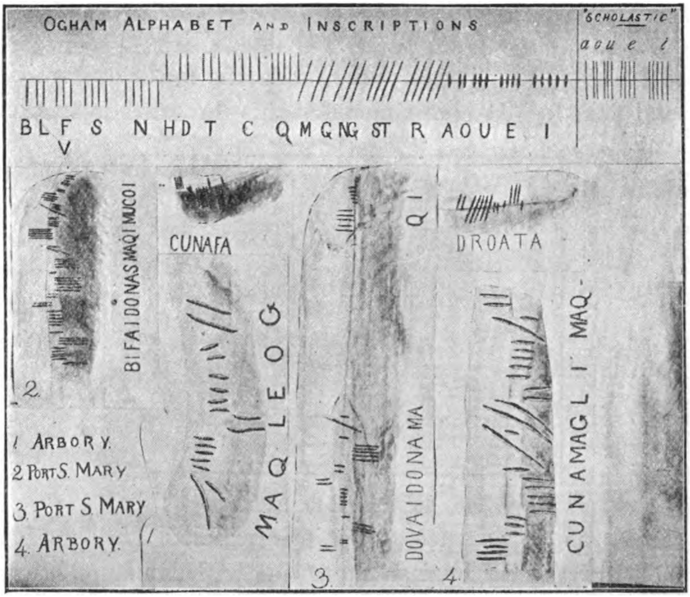

Fig. 27. Ogam inscriptions. Diagram by P. M. C. K. Scale $\frac{1}{15}$th.

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* Catalogue of Manks Crosses, P. M. C. Kermode, 2nd Ed., p. 4.

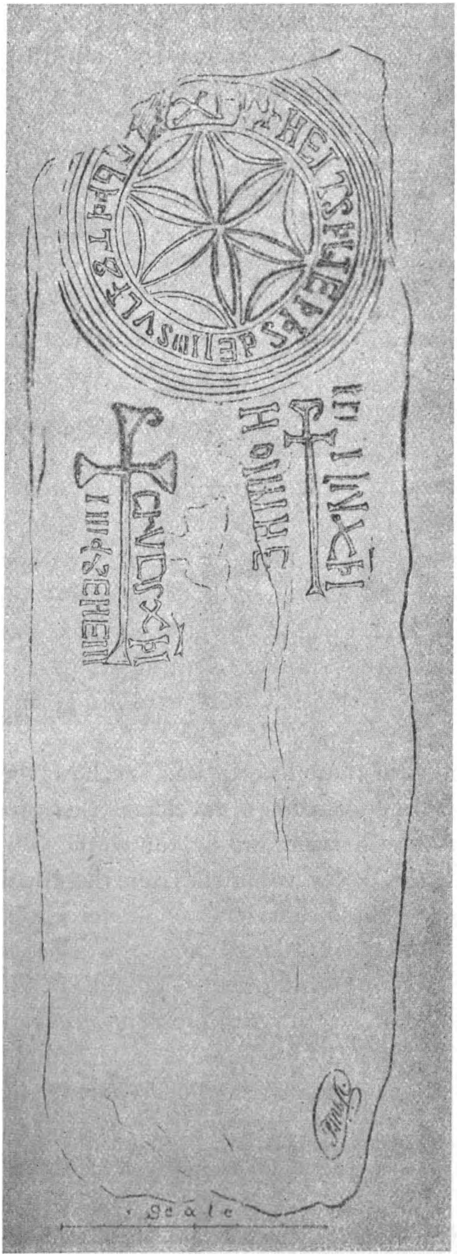

Fig. 28. Inscribed stone from Maughold.

Of the inscriptions, a few are in "Ogams"—characters forming an artificial alphabet, invented possibly by Irish scholars, who had become acquainted with the Roman inscriptions in Wales. Two of these have been found at Bemaken Friary, Arbory, and two in the burial ground of an early keeil at Ballaqueeney, Rushen. In language and character they exactly resemble Irish inscriptions of about the fifth century (see fig. 27).

One or two are in debased Roman, or Early British characters and Latin language of the sixth, seventh, or eighth centuries. The most interesting of these is a small slab found at

Maughold, by Mr. P. M. C. Kermode, in 1901, and figured and described in "The Reliquary and Illustrated Archæologist,"* July, 1902. Around a circle enclosing a Hexafoil design is the following inscription, of which, unfortunately, the beginning is broken off:—NEITSPLI EPPS DE INSVL. It is here met by some characters running in the opposite direction, of which one can make out the letters—BPAT. Below the circle are two small crosses (of the very rare form met with at Kirk Madrine, Wigtown) down by the sides of which runs the following unique formula:—

[FECI] IN XR̄I HOMIHE
CRVCIS XR̄I IMAGEHEM.

With two exceptions the H form stands for N (fig. 28).

This is probably earlier than the 8th century. Another cross, formerly on a hedge at Port-y-Vullen, Maughold, but now in the churchyard, bears across the edge the simple inscription, *Crux Guriat,* a name met with in North Wales in the 9th century. The upper part of our figure 29 shows the inscription from a rubbing, one-fourth actual size.

The greater number of these inscriptions are, however, in "Runes," the peculiar characters developed three or four centuries before the Christian era by the Goths, who came in contact with the Greek colonists from the Black Sea trading for amber. These characters underwent great changes in the course of centuries, and are classed according to their period as Gothic, Anglian, and Scandinavian. A solitary example of the Anglian runes of about the eighth century has recently been found at Maughold. Only eight characters now remain, a twelfth part of the

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* We are much indebted to the courtesy of the publishers of that periodical for the kind loan of some of the blocks which illustrated Mr. Kermode's paper.

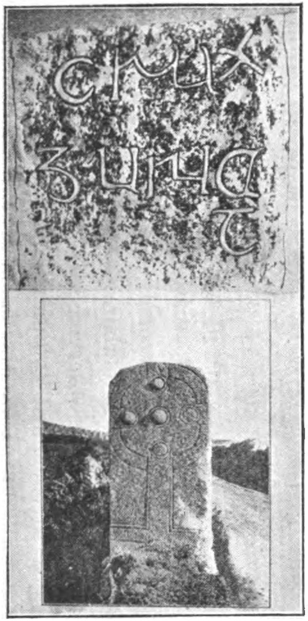

FIG. 29. Inscribed Cross from Kirk Maughold. *Crux Guriat.*

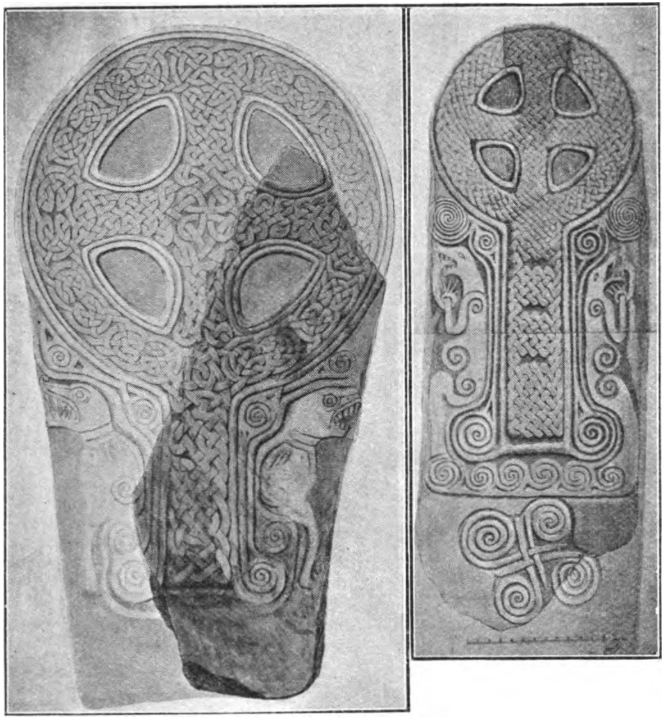

FIG. 30. Crosses at Conchan, restored. Typical examples of Celtic decorative art.

inscription, if, as seems likely, it was continued round the circle. They are perfectly legible, reading—BLAGC-MAN. The stroke between the C and M may be accidental, or it may be a punctuation sign. If forming one word, this would make a known Anglo-Saxon name. The rest of the Manks inscriptions are in the later Scandinavian runes of the tenth to the thirteenth century.

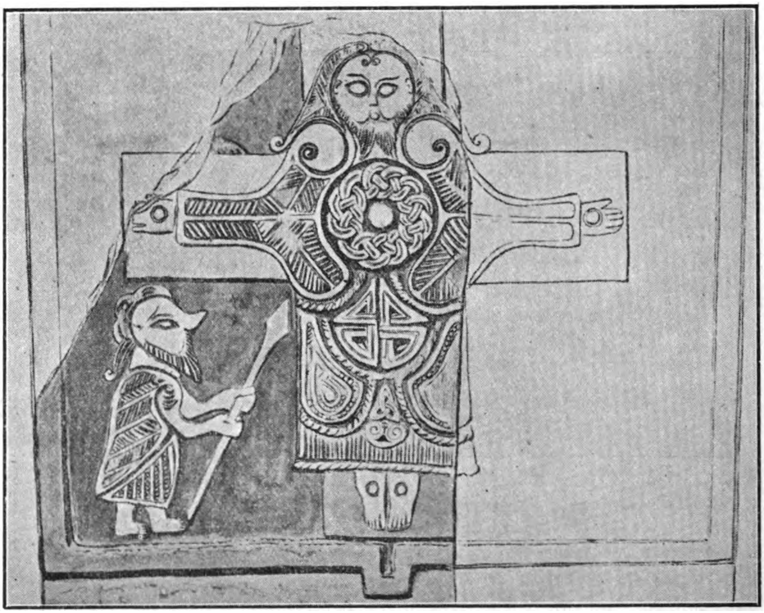

FIG. 31. Cross from Calf of Man.

The earlier pieces are of unhewn stone, and bear on one or both faces incised crosses of different forms (fig. 24). Later, we find the crosses sculptured in relief, and the stones more or less elaborately decorated, "a regular development may be observed from the most simple plait and twist to the most complex and beautiful geometric designs, and then from the geometric to the zoomorphic

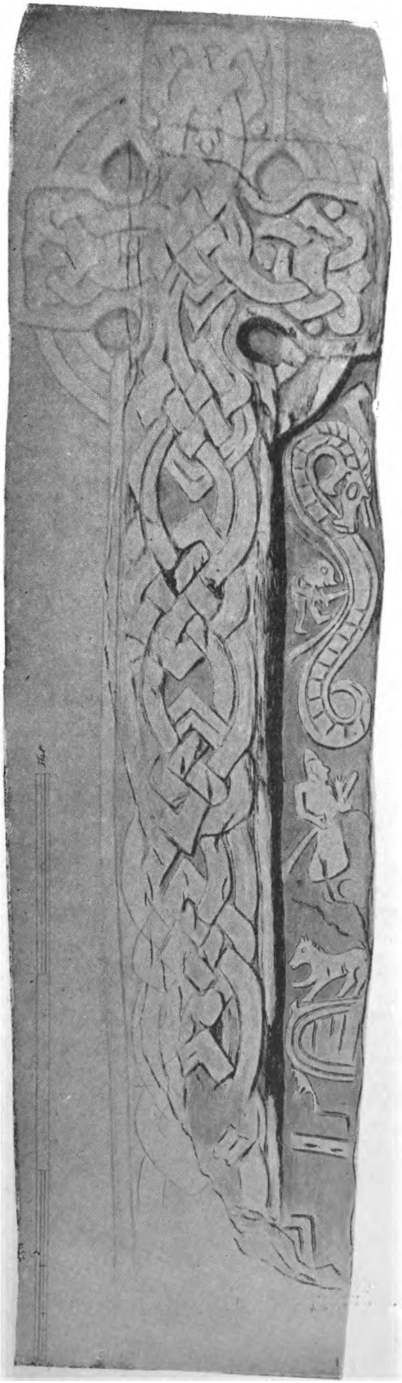

FIG. 32. Sigurd. Jurby.

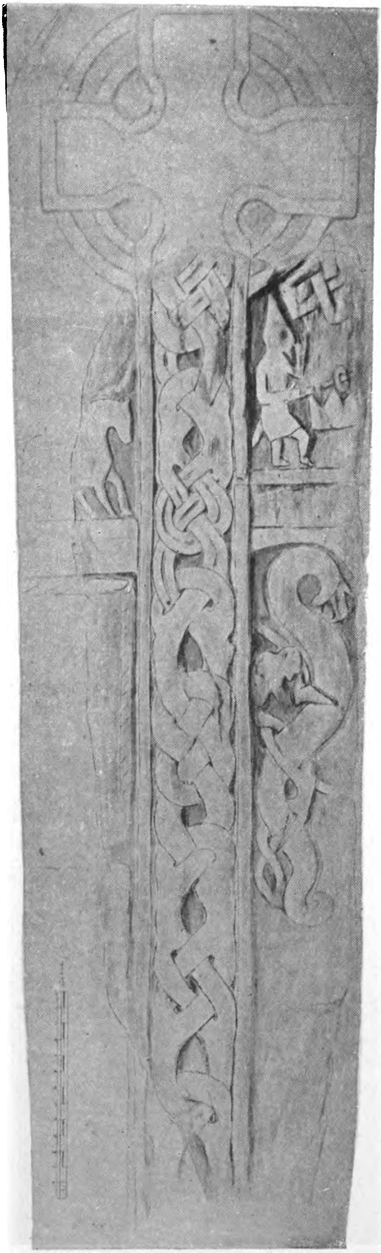

FIG. 33. Sigurd. Malew.

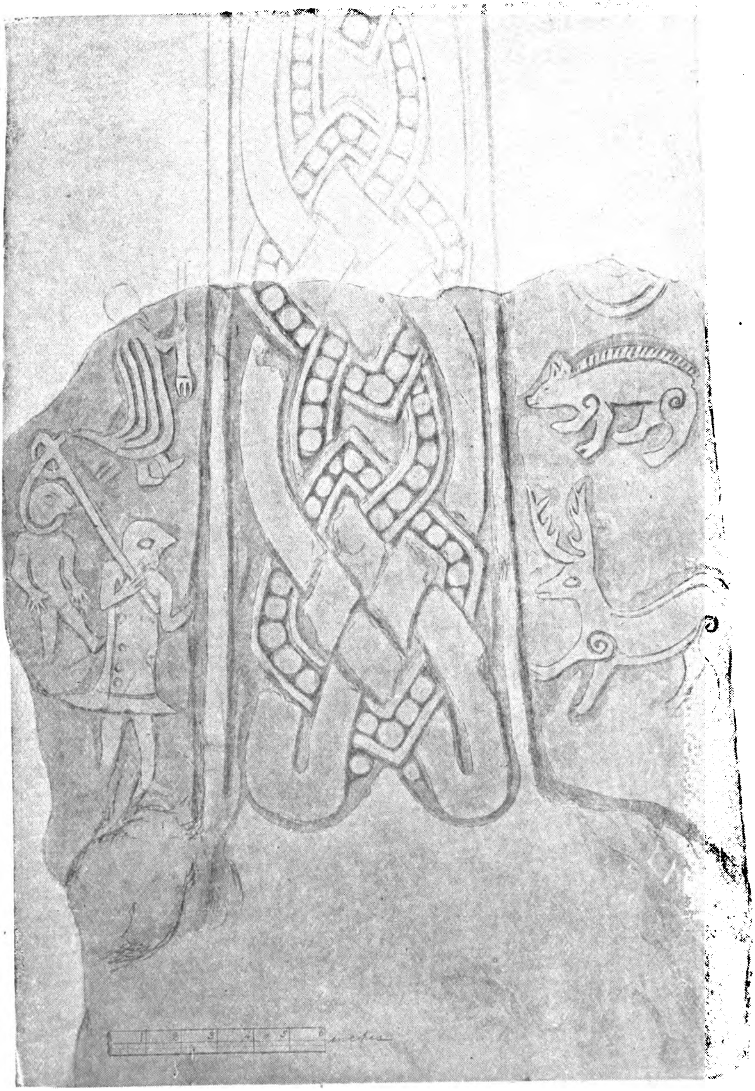

FIG. 34. Odin. Jurby.

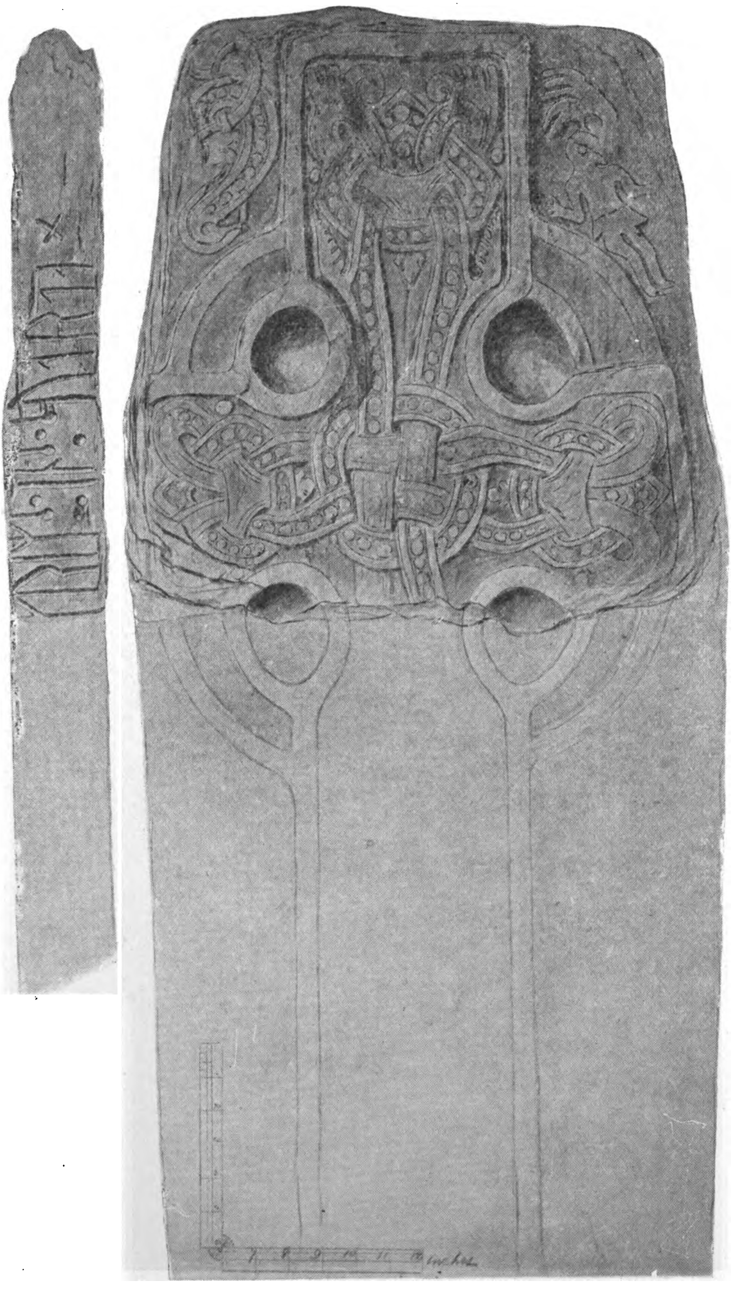

Fig. 35. Hrae-svelgr (Grim's Cross). Michael.

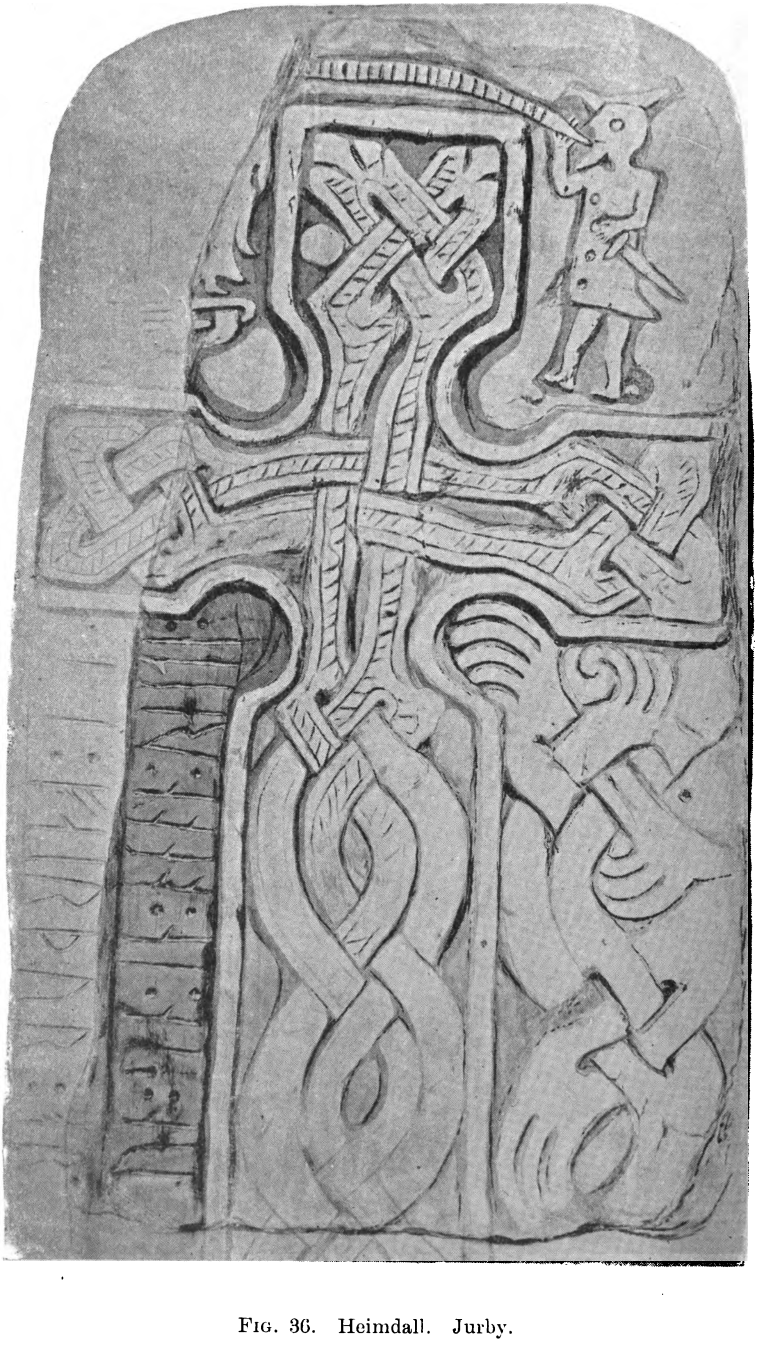

Fig. 36. Heimdall. Jurby.

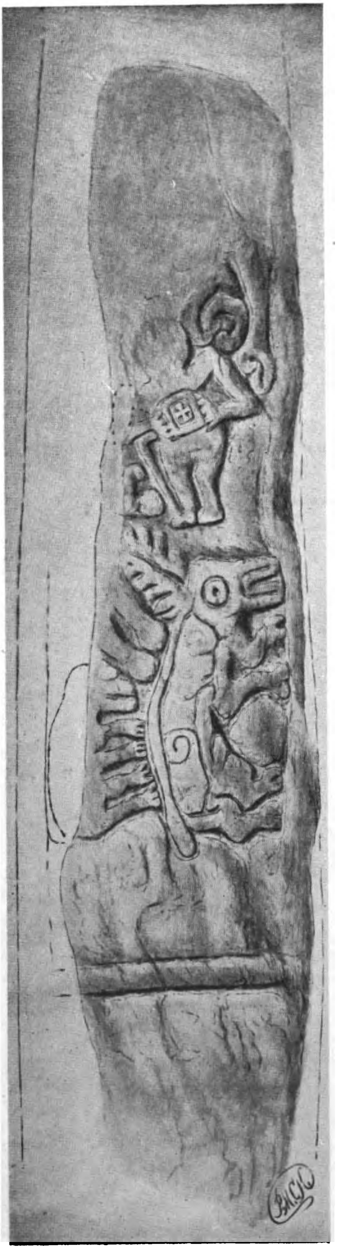

Fig. 37. Bishop's Monument (?)
Kirk Maughold.

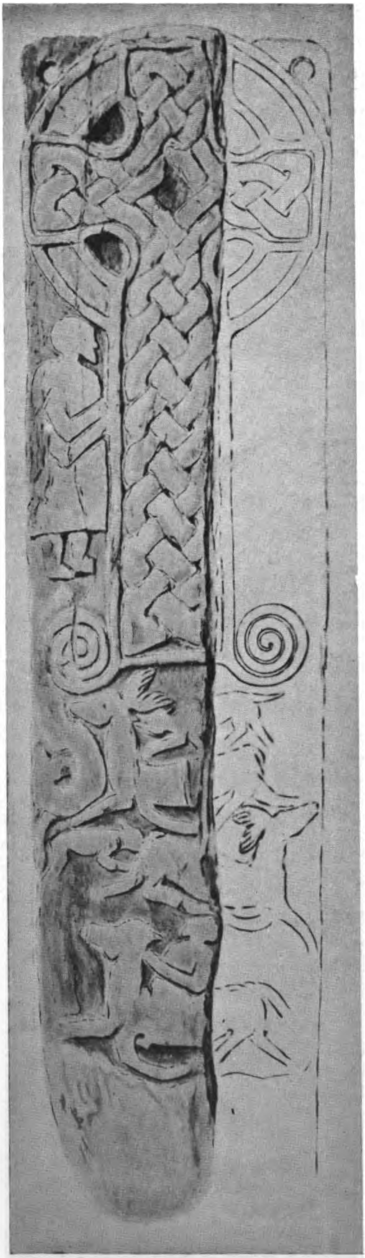

Fig. 38. Celtic Cross.
Kirk Maughold.

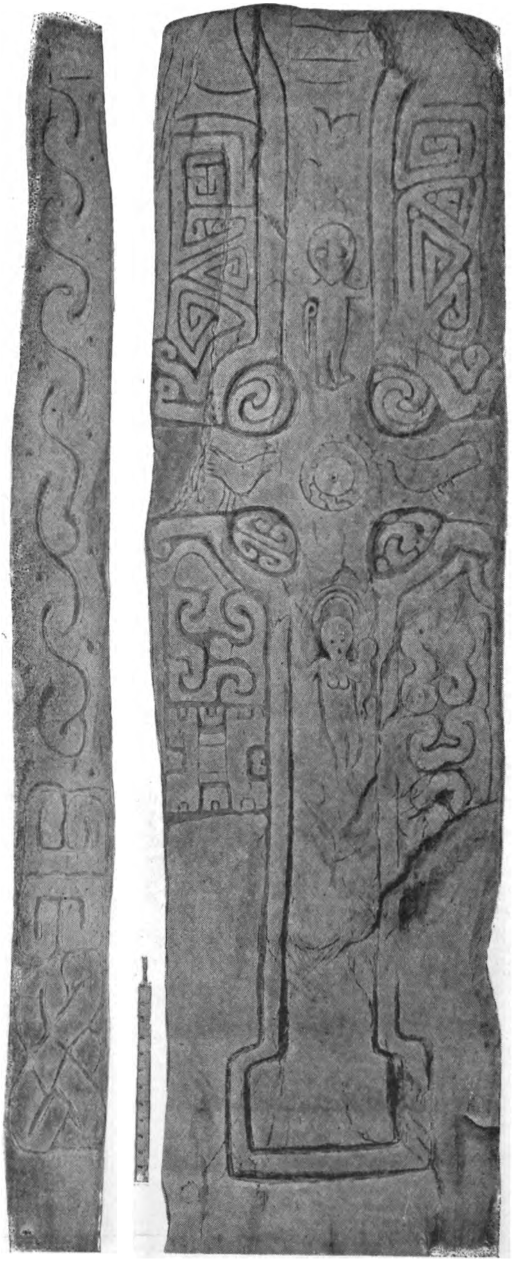

FIG. 39. Roolwer Cross, front and edge.

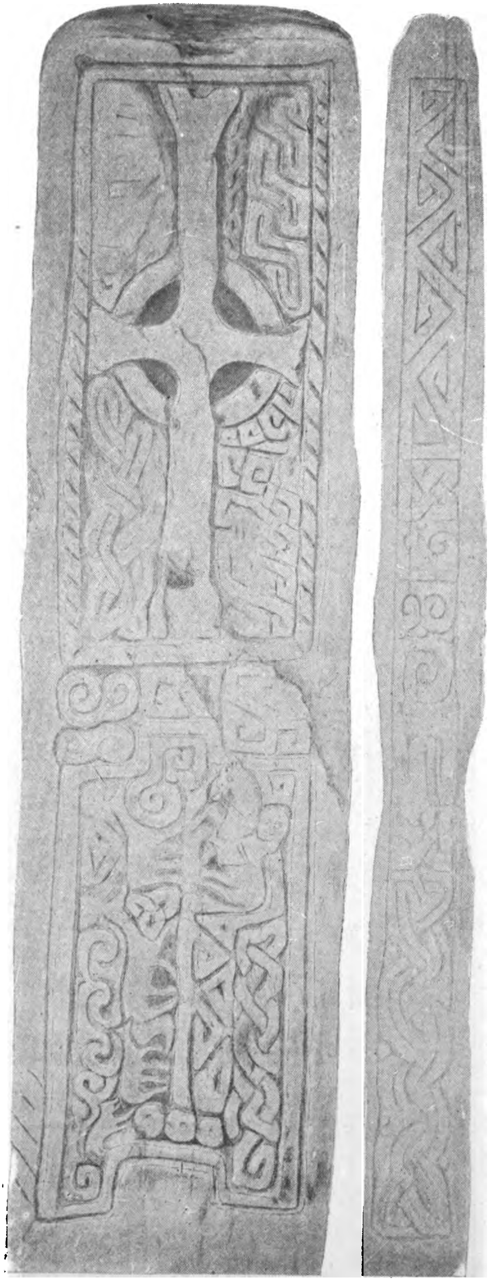

FIG. 40. Roolwer Cross, back and edge.

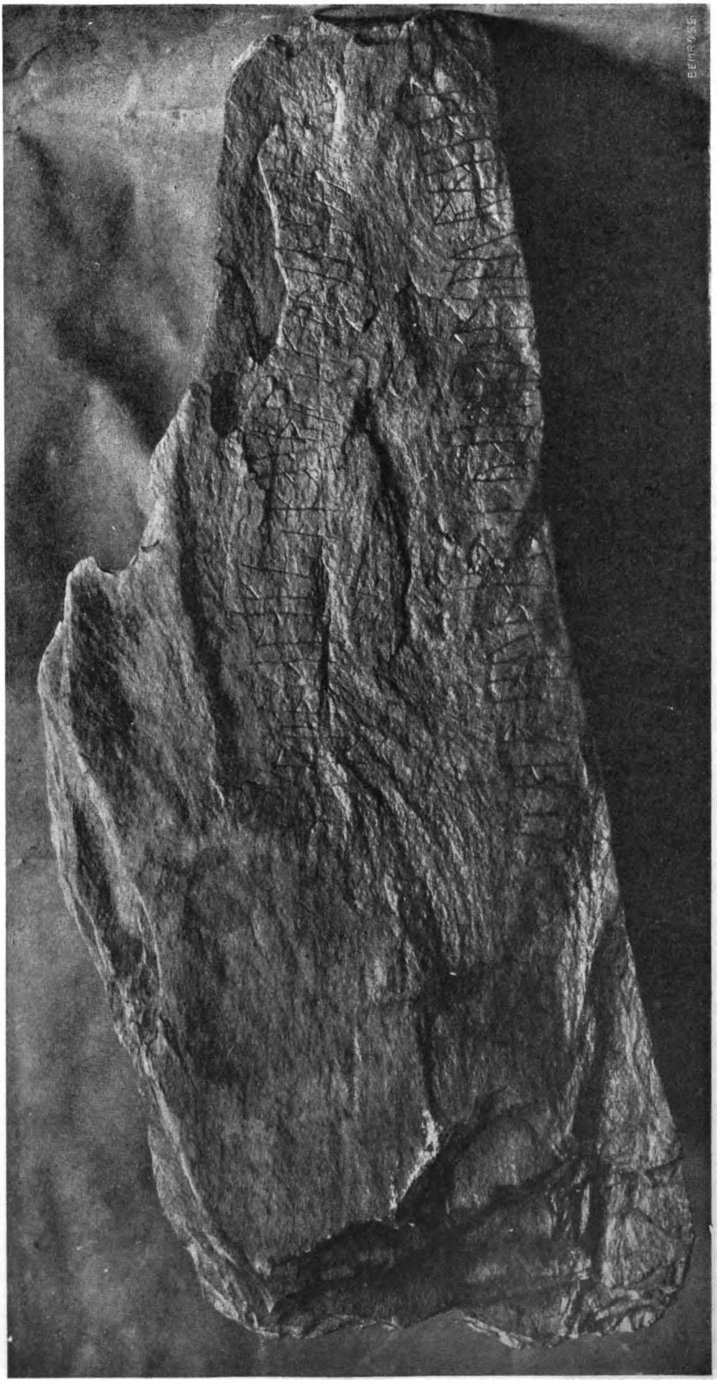

FIG. 41. Runic Inscription from Corna in Maughold.

(figs. 29 and 30). A striking feature is the realistic and admirably drawn forms of birds and beasts of the chase and of men, though the latter are not generally a success, and occasionally of the human form with heads of birds or with wings."* Some of the designs, as well as the general decorative treatment, are peculiar to the Isle of Man, and all exhibit true artistic feeling, and most of them skill in execution. A few of the older Celtic pieces exhibit Scripture scenes:—The Temptation of Adam and Eve (Bride), Daniel in the Lions' Den (Braddan), The Virgin and Child (Maughold), and the unique Crucifixion from the Calf of Man, an example of pure Byzantine art (fig. 31). It is also of peculiar interest to note the work of the first Scandinavian Christian sculptors, following the earlier Celtic models with great freedom and evolving effective designs from the most simple motives. Finally, we find on later pieces illustrations from the old Norse Myths (figs. 32 to 36)—a series illustrating the story of Sigurd Fafni's-Bane, and figures of the gods Odin, Thor, and Heimdall, and of giants, dwarfs, and monsters. A complete collection of casts of over 100 crosses taken by Mr. T. H. Royston, of Douglas, finds a temporary location in the Masonic Rooms, Ramsey, and nearly all have now been figured for Mr. Kermode's book on the subject. We reproduce in the preceding eight pages, a series of ten typical examples, as follows:—

Fig. 32 shows a slab 7 feet long which was found as gate-post of a field at Jurby. Alongside the shaft of the cross we see, above, Sigurd in his pit—here ingeniously represented as a hollow mound— in the act of slaying the Dragon; below, he is shown sucking the thumb he had burnt in roasting the dragon's heart. One of the talking birds and Sigurd's steed Grani are also shown.

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* Catalogue of Manks Crosses, 2nd Ed.

Fig. 33 is a slab 5 feet long, from Malew, showing on the right, below, Sigurd from his pit piercing the Dragon. Above, Sigurd is shown holding the wand upon which the dragon's heart is roasting over a fire represented by three triangular flames, and sucking his burnt thumb which reveals to him the knowledge of what the birds around are saying. On the other side the steed Grani is shown, above, and below the panel is broken. The three Sigurd pieces known from the Island are claimed to have been carved by the famous Gaut Bjornson, of Cooly.

Fig. 34 is a fragment from Jurby, showing a stag and a boar to the right, and on the left a scene which is probably eagle-headed Odin taking a hero to Valhalla.

Fig. 35 shows what is known, from the inscription on it, as "Grim's Cross," from Michael. On the right at top is the wind-giant, Hræ-svelgr, corpse-devourer, in the form of a war-eagle or vulture tearing the body of some hero unknown.

Fig. 36.—The head of the inscribed cross from Jurby shows Heimdall, the warder of the gods, standing at the foot of the rainbow bridge (Bifröst) blowing a blast on his horn (Gialla) to summon the gods to their last great battle at Ragnarök, where they have to encounter the giants, demons and powers of evil.

Fig. 37 represents a sculptured slab from Kirk Maughold which, from the figure with book and pastoral staff, is possibly the monument of a bishop. The rest of the carving shows scenes of the chase—a stag and one or more hounds..

Fig. 38 is a very beautiful example of pure Celtic design and workmanship. It served for many years as lintel to the west door of Kirk Maughold. Here again a figure of a priest is shown, with stags and hounds below.

Figs. 39 and 40 show the two sides of Roolwer's Cross, Maughold, which Mr. Kermode believes was set up to the memory of Hrolfr, a Scandinavian who, as "Roolwer," is recorded in Chronicon Manniæ as being Bishop in Man about 1050.

Fig. 41 is the slab from Corna with the runic inscription carved by John-o'-the-sheep referred to above. The similar example of runes "writ by John the Priest" is unfortunately too large to be reproduced on our page. A figure of it will be found in Mr. Kermode's paper in "The Reliquary" for July, 1902.

The most notable ancient structures of the Historic Period are the Castles of Peel and Rushen. With respect to the former, which stands on St. Patrick's Isle, about 7½ acres in extent, we have already referred to the mound near the centre of the islet as having possibly been a stronghold since neolithic times. The first buildings of stone would probably be the originals of the Chapels of St. Patrick and St. German, and, next to these, perhaps, the Round Tower on the highest part of the Island. The upper part of the latter has apparently been rebuilt in mediæval days, but it is likely that it was never much higher than now, resembling in this respect the Towers at Turlough and Dromiskin, in Louth. It is 50 feet high, the circumference at base is 45 feet. About 7 feet above the ground is a doorway looking eastwards (facing the entrance to St. Patrick's). The tower is built of sandstone regularly laid in courses, the wide jointings filled in with extremely hard shell mortar. Near the top are four square-headed apertures facing the cardinal points, and one other lower down on the N.W. or seaward side. It is, as now seen, more cylindrical than the Irish towers, but its design and use as belfry, and as keep in which relics and valuables were deposited, and into which the ecclesiastics could retire for security, were no doubt suggested by these.

The Cathedral is cruciform, having a central tower, but without aisles or porches. Its internal length is 114ft. 6in., the width at the intersection of the transepts is 68ft. 3in. The height of the tower, including the square belfry turret, is 83ft., and of the choir wall 18ft.; the thickness of the wall 3ft. The Rev. J. Quine thinks the Early English, Decorated, and Norman chancel was built during the Episcopate of Michael, about 1195, and that even then it may have been on an older foundation; but the tower, transepts, and nave were the work of Symon (about 1226), previously Abbot of Iona, which may partly account for the resemblance to Iona, and the position of the Bishop's Palace adjoining the Cathedral on the north. At a later date the so-called crypt was inserted under the chancel, the floor of which was raised nearly three feet. The north transept arch is Early Decorated, the southern and western arches are later work.

The fine embattled walls (four feet thick) surrounding the islet are said to have been erected by Henry, fourth Earl of Derby, in 1593. The approach has been ruined in appearance by modern quays and cement work, but one may still see some of the rude steps, cut in the solid rock, leading to the portcullis door of the old square tower, which is supposed to be early fourteenth century work.

Godred II. died here in 1187, and King Olave also died at Peel, in 1237. We read of Reginald's descent upon it in 1228, when he burnt Olave's ships and those of all the chiefs of Man. It seems, therefore, that Olave must have had a stronghold here, though now no trace remains, unless the entrance tower is of that date. Our figure (fig. 42), giving a general view of the Castle with the Round Tower in the distance, is from a photograph by Mr. G. B. Cowen.

Rushen Abbey, on the Silverburn, in the village of Ballasalla and Parish of Malew, dates from the twelfth century, Ivo, Abbot of Furness, having in 1134 received a grant of lands for the purpose from King Olave. Cumming thinks there may have been some sort of a religious house earlier, though there is no notice of buildings in the Chronicon Manniæ (kept by the Monks at the Abbey) till 1192, when it is recorded that the monks were transferred to Douglas for four years, during which they were engaged in enlarging the accommodation at Rushen. The Church was not completed and consecrated till 1257. According to Chaloner's drawings, made in the seventeenth century, there were five towers of rude masonry, with square-headed openings. The only decided architectural detail is a plainly chamfered arch in the Church tower, one apparently of an arcade running North from the tower, three others now in the Grammar School, which was the old Church of St. Mary, Castletown,

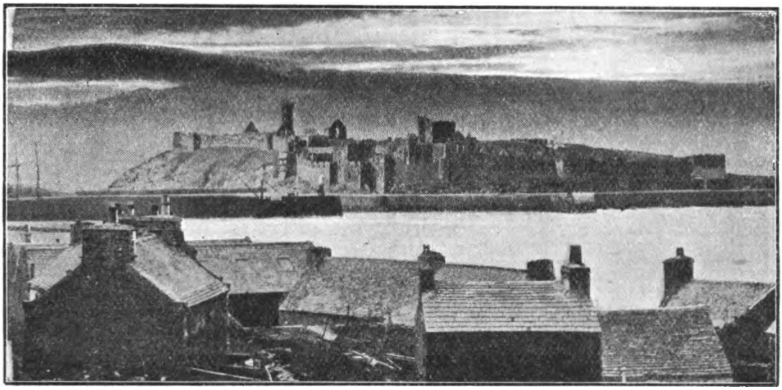

FIG. 42. View of Peel Castle on St. Patrick s Isle, from the town. Photo. by G. B. Cowen.

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* Yn Lioar Manninagh, III., p. 405.

having, as argued by the Rev. J. Quine, been removed after the dissolution (1541), when the furniture, ornaments, and building materials were sold and scattered. A small vaulted passage, left standing at what must have been the west end of the Church, may, Cumming thought, have been connected with the crypt. On one of the key-stones of the arch is a socket for the suspension of a hook, perhaps for a corpse-light. Traces of inhumation have been met with in one corner. In this vault have been gathered a few carved stones and other relics recently recovered; also a fine coffin-lid, of which the exact original site is unknown. It is of thirteenth century work, and of interest as being the oldest stone monument of English or Gothic architecture in the Island, and, as marking the end of the old type illustrated by the Celtic and Scandinavian carvings referred to above. It may have been the tomb of Olave the Black, who was buried here in 1237, or of his son Reginald, 1248, or, even more probably, of the last Norwegian King of Man, Magnus, buried in the Abbey in 1265 (fig. 43).

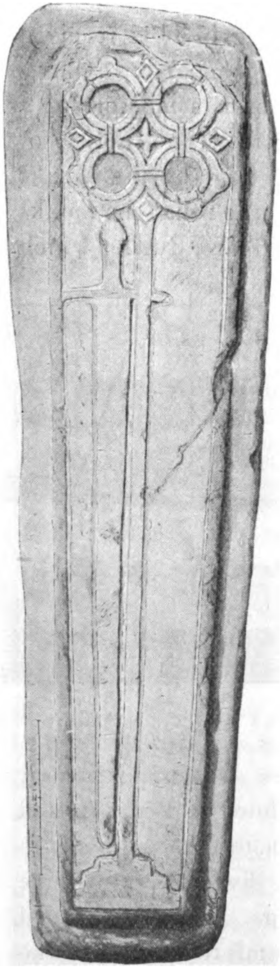

Fig. 43.

A square tower remains at the entrance to the Abbey grounds, which, on the east, would be well defended by the river, doubtless in those days deeper and at a lower level. An indication of the former level of the ground appears in the Refectory, now converted into a stable, where the tops of the windows appear almost on a level with the present floor.

Near by, at the foot of the mill dam, which may have been raised by the Cistercians themselves, is the "Crossag," an example of a thirteenth century bridge, nearly in the same state as it was left by the builders. Its breadth is just 3ft. 3in. clear in the centre. At the western end is a small subsidiary arch, somewhat of the Carnarvon type, or square-headed trefoil, but an original portion of the structure, a type of which we have several doorways in Castle Rushen. (One is seen behind the elk in fig. 3.) Some encaustic tiles of perhaps 15th century from Rushen Abbey are shown in fig. 44.

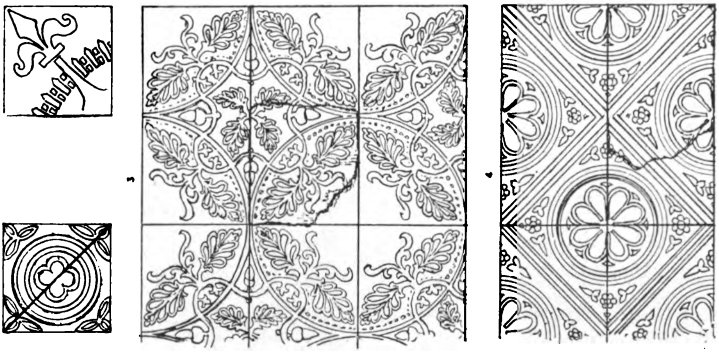

FIG. 44. Encaustic tiles, from Rushen Abbey.

Bemaken Friary in Kirk Arbory (Cairbre), though founded by the Grey Friars in 1373, has scarcely any remains, and none older than the fifteenth century. In the chapel, now a barn, may be seen the arches of the east windows, north door and window, and a south window—the square-headed trefoil. A wall forming the north gable of the farm house, 4ft. thick, may have belonged to the Refectory.

A few of the Parish Churches, such as Malew, Marown, Lonan, and Maughold show portions of walls, lights, &c., of the twelfth, thirteenth, fourteenth, and fifteenth centuries. In connection with the latter Church is the beautiful standing Cross at the gates (see fig. 45), the only monument of its kind in the Island, evidently of about fifteenth century date, and contemporary with the east window, recently removed, and with some other details found in the course of repairs. It is thus described by the Rev. J. M. Neale, in his Ecclesiological Notes (1848)--"A Third-Pointed erection, very perfect and beautiful. It is raised on four square steps—the stone is octagonal; the capital is adorned with four shields—one the arms of Man, one a mere wheel-tracery, the other two much effaced. From this springs the real Rood, bearing on its four sides our crucified Lord, our Lady and the Divine Infant, St. Bridget kneeling, perhaps about to take the veil, and St. Maughold."

The ruins of two keeils of later date than those already mentioned are well worth preserving. The first, on St. Michael's Isle, near Langness, was in ruins in Chaloner's days (1652-60). It is rectangular, 32ft. by 14ft. 8in. inside; the walls, of large and small stones, being 3ft. thick. At the west end is a single bell turret. The door, of which the jambs are rough blocks of limestone, was on the south, and had a semi-circular head. The east window, one lancet, arched; the north has the head out; the south and west were square-headed, the latter two 12in. wide outside, but with a splay inside to 2ft. 10in. The foundation of the stone altar may be seen under the east windows. The height of the side walls is only 10

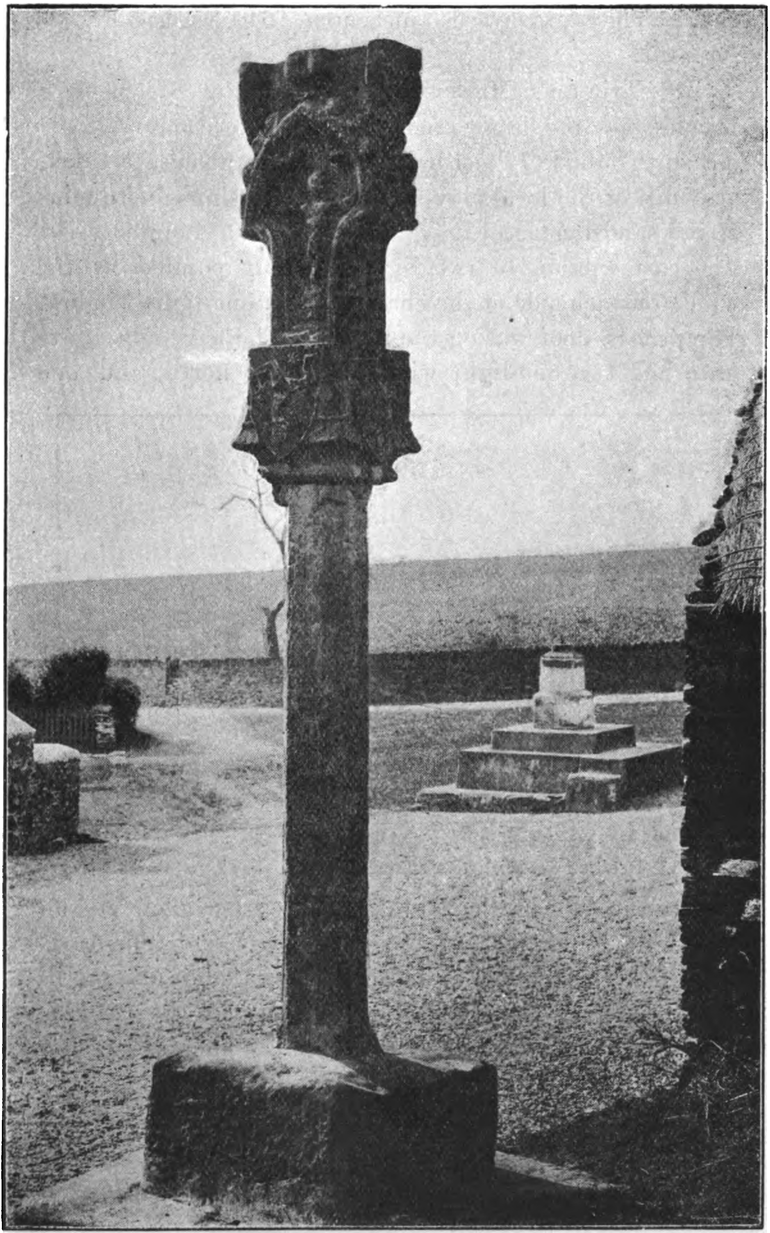

FIG. 45. East face of standing cross at Maughold. From photo. by G. B. Cowen,

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feet. The graveyard measures 64 yards by 33 (fig. 46).

St. Trinian's, Marown, is at the foot of Greeba, in a meadow by the high road from Peel to Douglas. It measures outside 75 feet by 24; the walls, about 4ft. thick, are built of the local clay-slate, with dressings and quoins of red sandstone, and it is of Early Middle-Pointed style. The east window of two lights, acutely pointed, is 4ft. wide; on each side of the chancel was a one-light window. The priests' door was on the north. The nave appears to have had two one-light windows on the north, and one besides the door on the south. The west window was an ogee-headed lancet, and its gable bears a double campanile. The rubble which supported the altar still remains about a foot high. The Stoup is in the east side of the south doorway, inside. There is a hole in the door-jambs as for a bar (fig. 47).

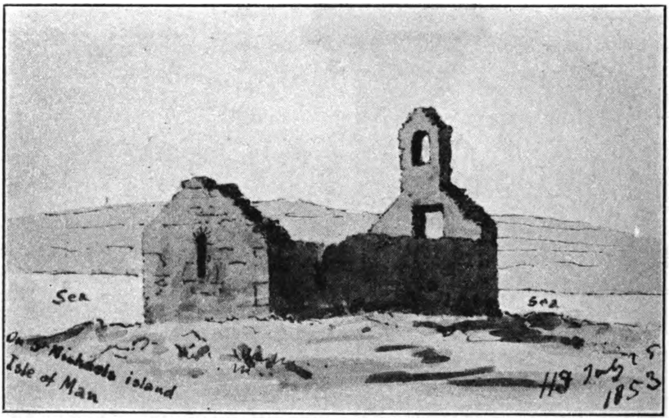

FIG. 46. Keeil on St. Michael's Island. From a sketch by Sir H. Dryden.

The finest of all the Manks historic monuments is Castle Rushen (fig. 48). According to the Chronicle, Robert the Bruce laid siege to it in 1313, when Duncan Macdougall held it against him for more than three weeks. The oldest portions of the existing walls are doubtless the underground chambers of the tower at the entrance. The Keep is of the Edwardian type of concentric castles, as distinguished from the solid square keep of earlier ages; some architectural details point to the middle of the 14th century, but so far neither the exact period nor the builder has been determined. Its height at the entrance is 74 feet, the flag-tower 80 feet from the present surface, which has been filled in to a considerable depth. The thickness of the walls is from 7 to 12 feet. At its northern extremity is a lofty portcullis, passing which one comes to an open quadrangular court, with a well in the centre. Outside, at a short distance is an embattled wall 25 feet in height and 9 feet thick, with several square towers at irregular intervals. Exterior to this was a fosse or moat, now filled up, outside of which is the glacis said to have been added by Cardinal Wolsey, when guardian to Edward, third Earl of Derby. On this were three low round towers or redoubts, of which one remains on the north-west side near

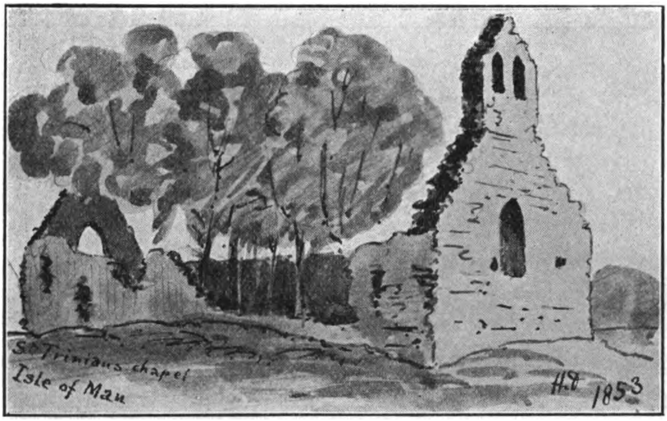

FIG. 47. Keeil of St. Trinian, Marown. From a sketch by Sir H. Dryden.

the harbour. We are indebted to Mr. G. B. Cowen for the general view of the Castle as seen from the Market Place (fig. 48).

The clock tower was the old chapel of the castle, about 15 feet square. On each side of the oriel window is a stone ledge on which rested the ancient altar; on the south side of it a piscina, and on the north a small niche (an aumbrie, or equivalent of the credence table) for the sacred elements. A small grated window in the north angle appeared to communicate with a cell, conjectured by Mr. Cumming to have been the confessional. The clock, with its curious dial, which hides one of the windows, was a present from Queen Elizabeth, and the bell, as shown by the inscription, was supplied by James, tenth Earl of Derby, in 1729.

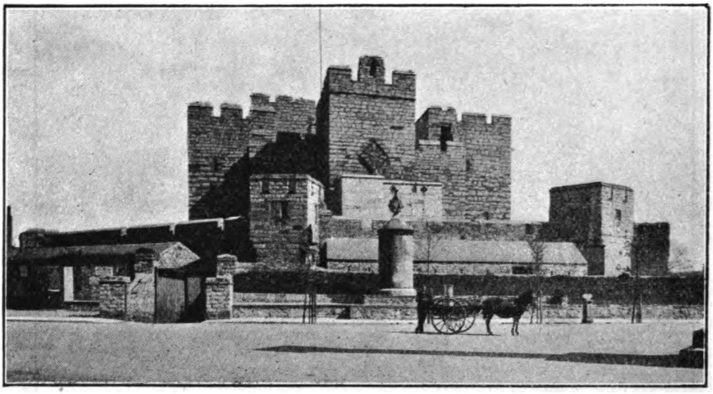

FIG. 48. View of Castle Rushen from the South. From photo. by G. B. Cowen.

Some additions to the buildings were made by James, seventh earl, when Derby House was added as a residence. A stone was found there with the letters D and I C, with the date 1645—James and Charlotte Derby, who resided here at that date. It would be very interesting and instructive to have a complete plan made of each floor of the castle. Mr. Armitage Rigby is now preparing such plans, and has kindly allowed us to reproduce here that of the ground floor of the castle (fig. 49).

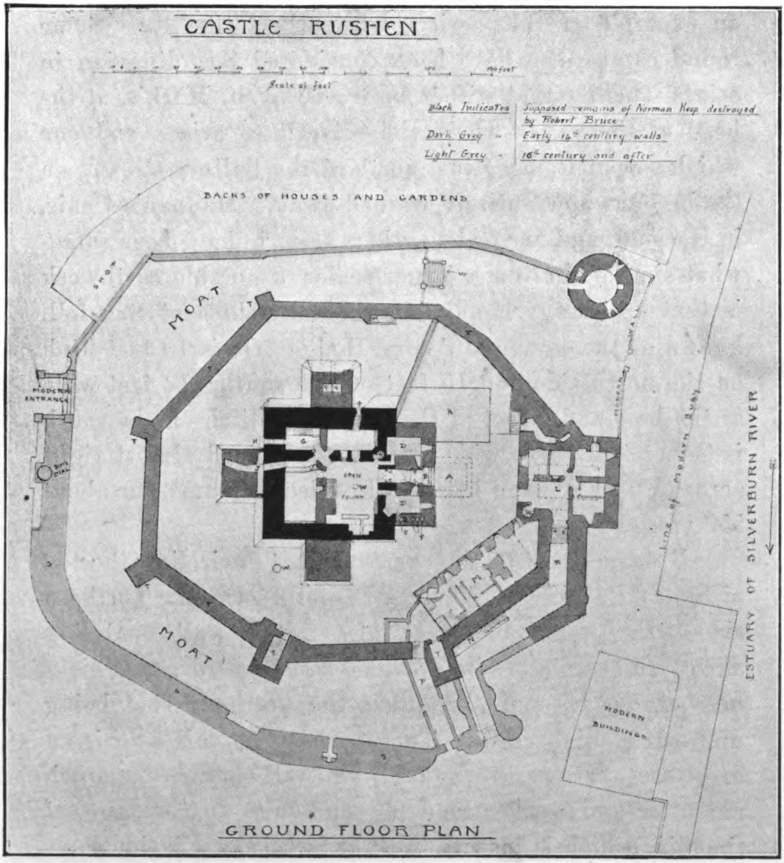
CASTLE RUSHEN
Scale of feet
150 feet
Black Indicates | Supposed remains of Norman Keep destroyed by Robert Bruce
Dark Grey " | Early 14th century walls
Light Grey " | 16th century and after
BACKS OF HOUSES AND GARDENS
SHOP
MOAT
MOAT
MODERN ENTRANCE
OPEN COURT
MODERN WALL
Line of Modern Quay
ESTUARY OF SILVERBURN RIVER
MODERN BUILDINGS
GROUND FLOOR PLAN

Fig. 49. Plan of Castle Rushen.

Of camps and small earthworks of the Historic period, besides those of earlier date still in use, the oldest recorded are those of Magnus, King of Norway (about 1098), of whom we read in the Chronicon Manniæ that he obtained timber from Galloway and from Anglesey and erected many forts in the Isle of Man. That at Baldrine may be an example of this period, with others like it. Some round camps also have been considered Scandinavian in origin, such as that still to be traced at St. Mark's, at the head of the valley where the Silverburn arises, and one which was at Ramsey just north of the Ballure stream, on the brooghs now entirely washed away. Mannan's Chair, in German, and one or two others seem to have been somewhat similar, but on a larger scale; a notable earthwork is that at Lhergyrhenny, on the west slope of Snaefell, known as the Bow and Arrow Hedge. It is 10 feet high on the north side and 15 feet on the south; 12 feet wide at the base and 6 feet at the top. The ditch on the south is 9 feet to 12 feet wide, and can be traced almost right across a neck of land between two deep streams, for about 550 yards.

But the finest of the camps is that encircling the top of South Barrule (formerly Wardfell). On the northern side of the summit are traces of dry stone walls enclosing an irregular area of about 22,000 square yards, the thickness of the base of a wall on the northern side being upwards of nine yards. The approach on this side is an easy ascent; on the south the wall has been much narrower and weaker, and perpendicular to the brow of the cliff, which is inaccessible; it is filled up inside so as to form a raised way or parapet. Some traces of a roadway into the camp are due to the fact that this spot was selected by the officers of the Trigonometrical Survey of Great Britain for the erection of their instruments for connecting with the triangulation of the British Isles.

At Ballachurry, in Andreas, is a fort, probably erected by James, seventh Earl of Derby, about 1644. It is rectangular, enclosing a space 50 yards by 40 yards. The earthen walls are six yards thick, with four bastions at the corners, all surrounded by a wet fosse of ample dimensions. About the same date was built Fort Loyal, of small size, to command Ramsey Harbour, which in those days would be at the north end of the Mooragh. The low mound of its foundations can still be traced. Probably remains on Gob-ny-Ronnag, Port Lewaigue, and elsewhere round the coast, were then either erected or strengthened and restored to use. On St. Michael's Isle is a circular embattled fort of stone, over the doorway of which is carved a coronet, with the date "1647." The walls are 8 feet thick, but not solid; it is badly in need of repair.

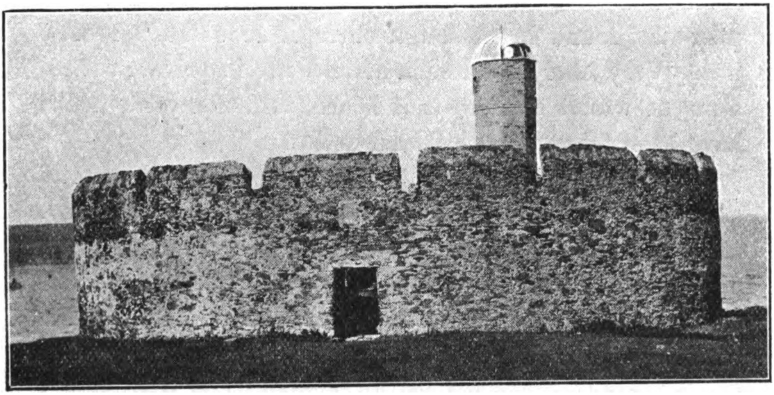

FIG. 50. Derby Fort on St. Michael's Isle. From photo. by G. B. Cowen.

Of loose articles of the Historic period some deserve at least a passing notice. We may consider them under the heads of—Weapons, Coins, Furniture, Ornaments, Implements and Utensils.

As regards the first, we have examples of cannon of the time of Henry VIII. and of Charles I. at Peel, and of

Elizabeth at Castle Rushen. At Bishopscourt are two small cannon from ships' longboats taken from Thurot in an engagement off Ramsey at the end of the 18th century, and others in Jurby and Bride are of the same period. Iron swords and daggers from Maughold Churchyard, and a broadsword and spear from Ballaugh village are in the Edinburgh Museum. "A basket-handled sword of great size and battle-axe" were found in a stone coffin in Patrick; swords were found at Glen Meay, and a sword and spear-head at Ballachrink, Jurby, but we do not know where these now are. An iron dagger-handle from Michael is in the collection at Castle Rushen. A pike-staff found in Ballaugh curragh about 1889 is now lost. Very likely other such articles are in private collections of which we have not heard, and many no doubt have been taken off the Island or lost.

At Peel Castle have been found stores of granite cannon balls, most of which have been recognised by Mr. Lamplugh as of Foxdale granite. A few stone, and one or two small iron cannon balls have been found also at Peel and in the north of the Island. The most notable historic weapon is the sword of state which used to be carried in procession before the sovereigns of Man, and is still borne before the Governor in the ceremonies at Tynwald. This was submitted to the authorities at the British Museum and considered to be of the 12th century. It is said to be exactly similar to that on the tomb of King John, and was thus described (Manx Society, vol. XIX., p. 21):—"Near the rest on each side are the arms of Man with armour on the three legs, and in the centre of this is a curious triangle . . . In its present state it is three feet six inches and one-eighth in length, but the point having been at some time broken off by improper usage, it was no doubt some four or five inches longer originally," ending probably in a sharp point. Our figure 51 is from a photograph taken for us by Mr. T. Keig, of Douglas.

A memorial of the ancient regal rights and prerogatives of the Island exists in its currency, coined and issued by the Lord with the sanction of the Tynwald Court. No notice is recorded of any insular money till 1679, when Governor Murray's copper penny became a legal tender. Subsequently various supplies of coin in copper were issued by the Derbys and the Dukes of Athol. These were stamped with the three legs and motto, and, on the reverse, the Eagle and Child, with the motto, "*Sans changer*," or some other insignia of the Stanleys, with the initials of the reigning Sovereign. The Duke of Athol stamped his copper coinage with the letter A, and a crown on the obverse. Our figure 52 is taken from Plate I. of the Manks Society, Vol. XVII. About 1825, paper cards or tickets, stamped for 1s., 2s. 6d., and 5s. British were legal currency; also copper pence tokens by small bankers in all parts of the country, with one pound notes of private bankers licensed by the Insular Government. Gold and silver coins of Saxons, Danes, Normans, English and Scottish have been found frequently, and it is

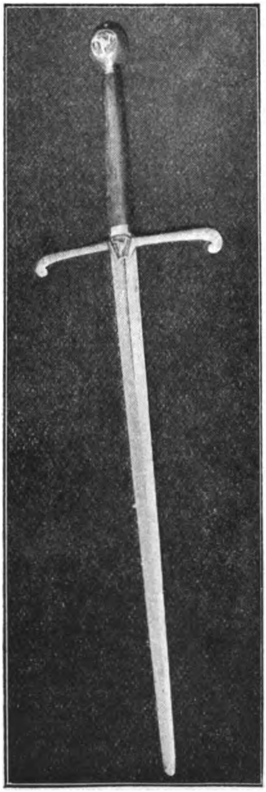

FIG. 51.

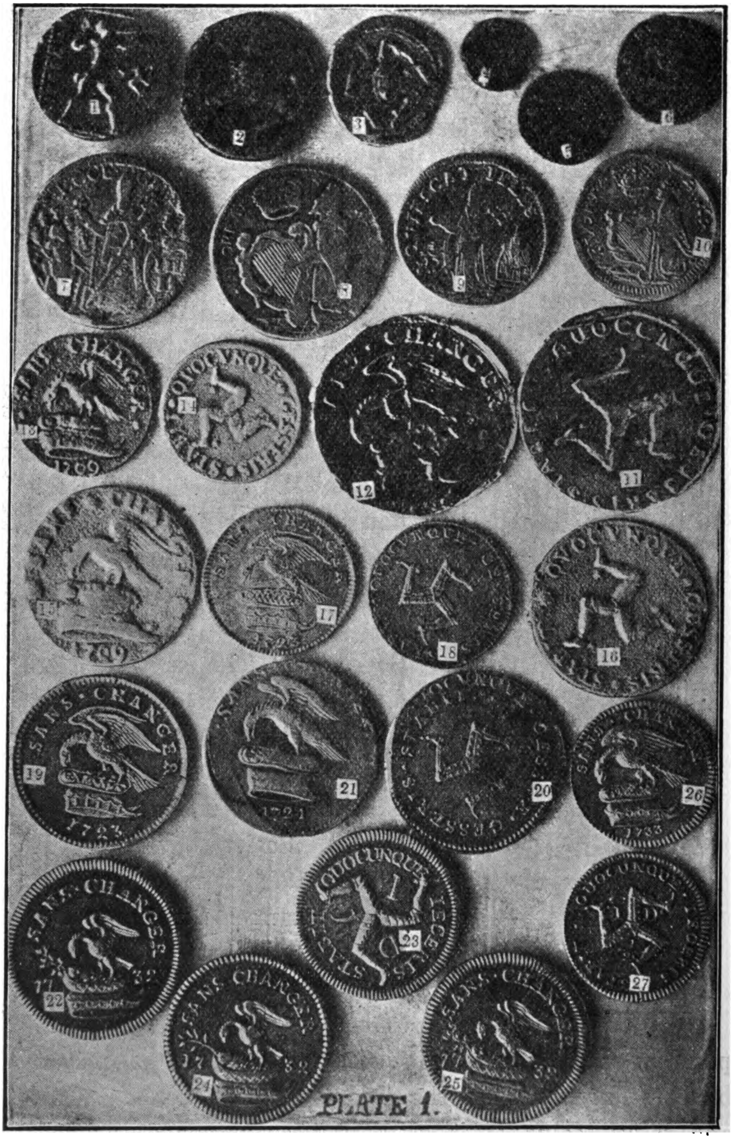

Fig. 52. Samples of Manks coins.

stated that when the Mandevilles from Ireland pillaged the Island in 1315 they carried away large quantities of silver money which they found secreted.*

Under the head of Furniture and Ornaments may be mentioned the stone reliquaries at Peel Cathedral, several rude stone fonts (pre-Reformation), as at Maughold, Bride, Marown, and a beautiful stone holy-water Stoup, 4in. high, and 6in. to 7in. diameter, recently found at a holy well by an ancient keeil on Grenaby, Malew (fig. 53). Very little pre-Reformation Church plate has been found. At Jurby we have a beautiful silver chalice, which was figured and described in the Illustrated Archæologist, January, 1895. The hall-mark shows it to date from 1521; the bowl is broad and shallow, stem plain and

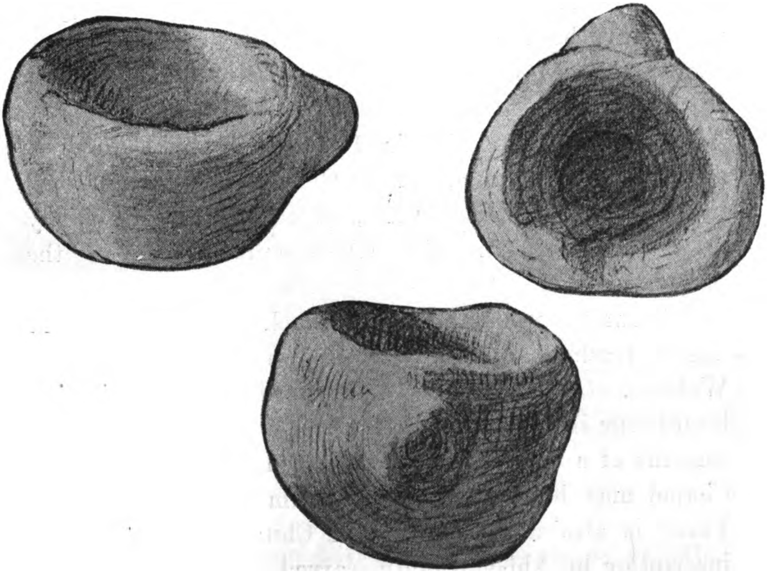

Fig. 53. Stone Holy-water Stoup, at Grenaby.
From a sketch by B. S. Herdman.

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* List of Manks Antiquities. P. M. C. Kermode. Manx Society, XVII.

hexagonal, with hollow chamfered mouldings at the junction with knop and foot; knop of six-lobed type, with angel-marks on the points; the foot is hexafoil, and the vertical edge of the base has a border of leaf and flower design.*

At Malew is a brass Crucifix of the twelfth century, and a silver Paten of 1525. As regards the latter, the Bernicle in the centre instead of an Agnus Dei, or Hand in Benediction, establishes it as pre-Reformation, about 70 others being known to be in existence.

Some encaustic tiles of fourteenth and fifteenth centuries have been found at Rushen Abbey. We figured above some pieces described in "The Reliquary," January, 1885, by the late Ll. Jewitt, Editor (see fig. 44).

Some fragments of stained glass from Peel Cathedral, now in possession of Sir James Gell, have been described in Manx Soc., Vol. XXIX., p. 21. They are chiefly interesting as showing the earliest representation of the three legs.†

A curious wooden Mace in black and gold, now in Castle Rushen, from the collection of the late Mr. Wallace, of Distington, was described by him as having been borne in procession before the Manks Bishops. The remains of a carved oak Rood Screen from the Nunnery Chapel may be seen in the Museum at Castle Rushen. There is also at Arbory Parish Church an interesting inscription by Abbot Ratcliff, carved in oak.

A few gold and silver ornaments have been preserved; some, as a silver necklace and bracelet, found in Andreas, in 1868, and gold and silver rings and bracelets found in Douglas in 1894, having been claimed as Treasure

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* Manx Soc., XV., 107-109. Yn Lioar Manninagh, II., 227.

† Excepting perhaps a seal in the British Museum, A.D., 1300. (See Oswald; Vestigia.)

Trove, are now in the British Museum. A few, like the Mylecraine Silver Cross, and the Gold Whistle shaped like a Cavalier's boot, found in the Fort at St. Jude's, are in private hands. No doubt many have been carried away, lost, or destroyed.

Among implements, utensils and household furniture must first be mentioned the querns,* (fig. 54) or hand-mills ("braain"), frequently of granite, which must belong to various periods; some have been recognised as probably of the Iron Age, and some, as the "Saddle stones," may be a good deal older.

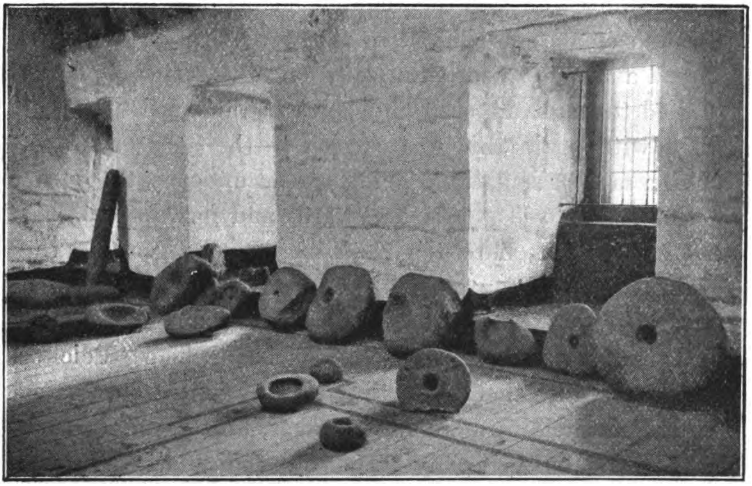

FIG. 54. Manks stone querns in Castle Rushen.

In later historic times the corn was dried in small kilns attached to the farm. Thrashing was performed with a flail ("soost") composed of two stout and straight branches, fastened together by a thong of hide. The portion held in the hands was called "laneraghyn," and the head or part which beat the corn, "slatt-hoost." These have gone out of use within the last twenty years. Two men or women would work together, having a sheaf of corn spread out before them on the floor, which in that spot was made particularly strong and thick, as may still be seen in some old barns. In winnowing a sieve or tray, "Dollan-benalt," was used in the open air. This was made by bending a thin band of wood, the ends overlapping and tied together by means of a tendon run through small holes bored in the wood. Over this was spread a sheep or goat skin, sewn on to the band by cords plaited through the skin and holes in the wood. Being filled with grain this was carried to the door or into a field, a sack or something being spread underneath. The dollan was moved gently backwards and forwards so that the wind might blow the chaff away. In grading the grain, and in the process of meal sifting, similar trays, but perforated, were used, holes being made in the skin by boring with a small red-hot iron bar. The "Peick," very much like the dollan, but smaller and deeper, was used for holding bonnags, cakes, meal, and such like, and was generally kept on the "latts" in the kitchen.

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* One of these bears a simple cross-shaped design in low relief.

Straw taken from the flail without being broken ("gloyee") was turned into rope, "suggane." Such ropes of straw and hay are still used to secure thatches of cottages and stacks. They are made by "twisters," rods or branches of willow or ash, bent in U-shape, the thicker end elongated and revolving inside a hollow wooden handle. The other end is bent by a string tied to its point, and attached to the first at the point where it enters the handle. A portion of the straw or hay being made fast to the loop, the bent rod is twisted by one man walking backwards, while the other is engaged in teasing out the hay gradually and evenly.

The long narrow spade used for digging peat is now seldom to be seen. Another implement gone out of use was the push-plough, of which there is a single example in Castle Rushen. This was used for breaking up hard ground before ploughing, much as the grubber is at the present time. Ling-drawers are still to be met with. These resemble sickles, some being toothed, some plain. Blunt sickles also were used for drawing gibbons out of the sand. The "Lister" was a straight-pronged trident used for spearing flukes. Straight-pronged iron forks, or "grips," were made by the local blacksmiths for farm purposes also before the introduction of the modern curved steel forks. These were used also in digging gibbons (the lesser sand-eel, *Ammodytes tobianus*).

In old days the "fidder," or weaver, was an important personage, most parishes having one or more hand-looms, but now the modern mills have taken their place. The old spinning-wheels also are fast disappearing. They all had the "quiggal" or distaff attached to them, so that the same wheel could be used either for flax or wool. Flax, commonly grown in the Island until some 50 years ago, when cut, was left lying for some time in water, then sent to the tuck mill, "Myllin walkee," to have the skin or bark torn off, after which it was combed by a "heckle" into the condition of tow, when it was ready for spinning. Sometimes the carding of flax would be done at home, the heckles used, of which some examples may be seen in Castle Rushen, being exceedingly primitive. A "swift" was required for winding the balls off into hanks, which were then ready for weaving into linen.* The spinning of wool for stockings or cloth was somewhat similar, only the quiggal was removed from the wheel, the "rolls" being kept on the knee. After the wool from the sheep had been washed and picked, it was carded with combs, "threden olley," and then, with a quick turn of the wrist, made into short rolls with the back of the combs. When two spools of wool had been spun, they were put on the "clowan broachey," reel bobbin or wheel spools; the spinning wheel being then turned the reverse way, twisted them together into strong "threads," ready for knitting into stockings, or for weaving in the hand-loom into cloth or dress material. If the thread was required in hanks, as it would be for making cloth, a "crosh-lane," hand-cross, would be used; this crosh-lane was made of wood somewhat the shape of an anchor. The thread was put round it and thus formed into hanks. If, again, hanks were required in balls, there was the "chrown thross," winding blade, for that purpose; in shape this was like the sails of a windmill, and, fixed in a wooden stand, revolved in something the same manner. One kind, after 60 revolutions, made a little "clic," showing that a certain quantity of wool was wound, and then started afresh.

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* See an interesting article by Miss A. M. Crellin, in Yn Lioar Manninagh, Vol. II., p. 265.

With regard to lighting arrangements, an original natural lamp used here until quite recently was the "Tanrogan," or large scallop (*Pecten maximus*), the hollow upper shell of which made a natural saucer in which a wick of rag or rush would lie in solid or liquid grease, sometimes lard, sometimes fish oil, or goose-grease. The "Cruisie" is very rare. It has an oil vessel formed with a spout from which the wick "bitte," projects, and hangs from a hook provided with notches by means of which the vessel can be tipped forward gradually as the oil burns down. A second and larger vessel fixed below is to catch the drippings of the oil. The iron rush and candle holder (fig. 55) is more common, but fast disappearing. For these, the rushes were cut in the summer, the peel removed excepting a narrow rib running from top to bottom, left to support the pith, and the cores thus obtained dried and bleached in the sun, while the strips of peel were twisted to form lankets for sheep. The cores were then dipped in scalding grease until thoroughly saturated, and after being allowed to cool were ready for use. The most simple type of iron holder for these rushlights had a thin point of the iron, about an inch long, split off for the purpose. The usual form had the lower end of the iron stand, which was

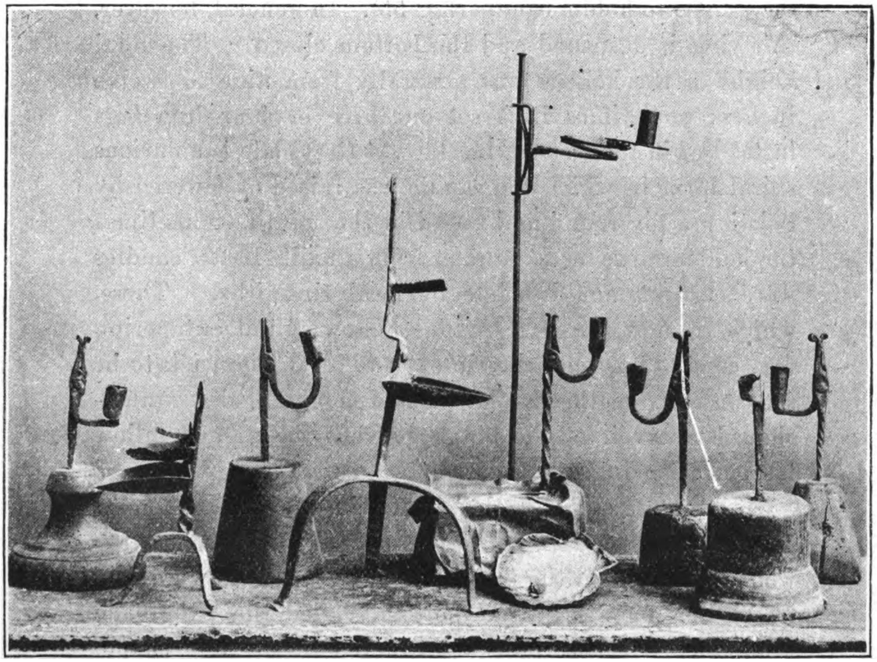

FIG. 55. Old Manks Tanrogan lamp, cruisies and rush-light holders—from a photograph. For the loan of this block we are indebted to the courtesy of the Publisher of " The Antiquary."

somewhat pointed, inserted for steadiness into a block of wood, generally cylindrical, or very slightly shaped. The upper end, about an inch in length, formed, with another piece of iron moving on a pivot, the jaws or nippers to hold the rush, the necessary pressure being given by a bent lever and weight at the other end. In a development of this the weight was formed into a ring or socket, which serves also to hold a candle (fig. 55). In general, however, this ring is deepened and the bottom closed. The total height of the holders was generally from nine to twelve inches; sometimes it is set on three or four iron legs instead of in the wooden block. At Orrysdale is a curious spiral form in which the candle was raised or lowered by twisting a pin round and round in the spiral. Sometimes the holders were made to hang from a nail. Later, candles were cast in moulds made by local tinsmiths. These, which are now scarce, were long hollow cylinders tapering to a cone at one end, the tip open to allow the wick to be set centrally in the mould. Later moulds had a funnel-shaped reservoir at the top to prevent the melted tallow from overflowing.

Home-brewed "jough," made in many farmhouses, was kept in deep, narrow, earthenware "crockans," a large wooden plug filled the top, and the beer was drawn off by a smaller one near the bottom, called the "thalbane pluggane." These crockans differed in size and shape, but were all tall and narrow, holding some two or three gallons. The round wooden butter box, taken by the fishermen to "the herrings," would hold a pound of butter. The owner's initials were often roughly cut on the top of the lid with a knife. This and flat cakes, of flour or meal, "berreenyn," baked upon a "losh," or baking-stone, the circular flag placed over a peat fire, were all they would take with them, the rest of their fare consisting of the herrings which they caught. As stated by Waldron (Manx Society, XI., 49), "the first course of a Manks feast is always broth, which is served up, not in a soup dish, but in wooden piggins, every man his mess. This they do not eat with spoons, but with shells, which they call sligs, very like our mussel shells, but much larger." The "piggins" are locally known as "noggins" – tumbler-shaped wooden cans, about four inches high, with one stave left projecting for a handle—in fact, the Scottish "luggie." Horn spoons, about nine and five inches long, were made locally, but are now rarely to be seen. Spoons of lead and pewter were in use until about forty years ago, and several of the moulds are still preserved. They were made by old women, who used to go round the parish carrying their own moulds and crucibles or "cressets." The spoons were about seven inches long, and were made, or "run," at a charge of a halfpenny each. The inside of the mould was smoked in the wick of a tallow candle; this prevented the lead sticking, one smoking being sufficient for six spoons.

It is difficult now to get a pair of "carranes," the shoes worn till about 50 years ago. They were made of tanned, and sometimes of undressed, hide, that of a heifer making about four pairs. The smooth side was worn next the foot. They were turned up all round, and laced at the back of the heel with a thong of hide

Settles of oak or deal were formerly to be seen in every chimney nook. There was but little carving, sometimes the back was open work, but generally plain. A few oak chests and some old armchairs of the sixteenth to the eighteenth century, are in the hands of private owners, and it would be interesting to have them all figured and described. Miss Christian, Baldromma, whose will was proved within the last few months, has set a good example by bequeathing such a chair, with the date 1685 carved upon it in bold relief, to Mr. P. M. C. Kermode, for the Manks Museum, in which she knew he took so great an interest. If this example were more generally followed we cannot doubt but that a very interesting collection would be formed illustrating the past history of the Island.

If the foregoing pages in any degree help to the establishment of such an institution as a well-equipped Insular Museum, by arousing interest in it, and by suggesting the character of its collections, so far as Antiquities are concerned, and, perhaps, by inducing our readers to secure for it before it becomes too late such articles as are illustrative of the past history of the Island, we shall feel that this little book has not been published in vain.

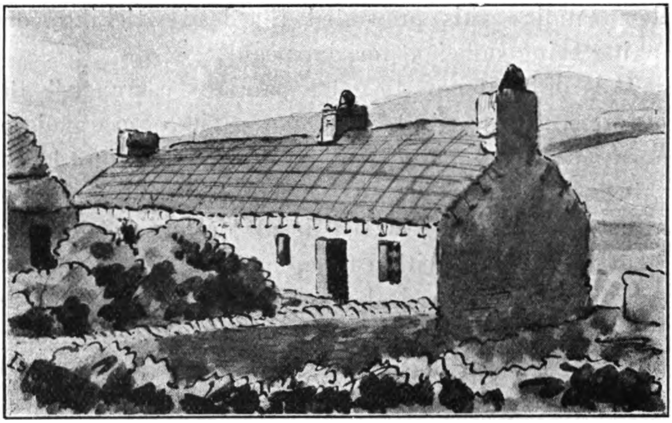

FIG. 56. Old type of long Manks cottage. From a sketch by Sir H. Dryden.

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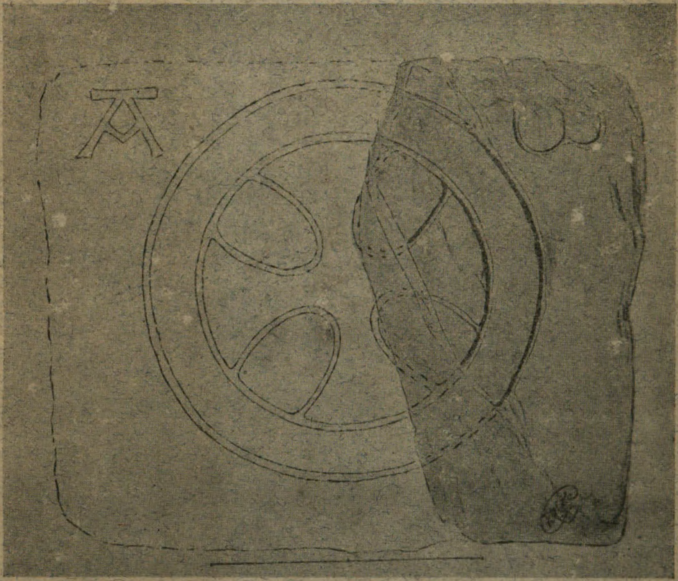

Alpha and Omega Stone, from Kirk Maughold.